

COMPUTER WORLD

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News Update

GMIS Seeks \$300,000 For Clearinghouse Plan

CW West Coast Bureau
LONG BEACH, Calif. — The Government Management Information Sciences Users Group (GMIS) plans to seek \$300,000 in federal funding to set up a technical clearinghouse for the transfer of computer software techniques among state and local government users.

Andrew O. Atkinson, chairman of GMIS Project '74, said the GMIS executive board last week had authorized Project '74 to seek the funding.

By mid-June, he said, the proposals for funding will be brought before the executive board for final review and adoption. The proposals will then be submitted to the Law Enforcement Assistance Agency (LEAA) for \$200,000 and the National Science Foundation (NSF) for \$100,000.

(Continued on Page 2)

Catamore Antitrust Claim Ruled 'Separate Action'

PROVIDENCE, R.I. — A U.S. District Judge here has denied the motion of Catamore Enterprises to amend its counterclaim against IBM to include antitrust charges (CW, May 21), but the firm said it would file a separate antitrust action against IBM.

However, Judge Raymond Pettine allowed the firm to amend the counterclaim to include eight separate charges of fraudulent practices on the part of IBM. The judge ruled against the inclusion of the antitrust issues on the grounds they were unrelated to the original IBM charge against Catamore for payment of back rent.

"The claim for treble damages under the Sherman and Clayton Acts involves a separate and distinct transaction," he said in his decision.

Catamore said it was "pleased" the judge had allowed the first eight parts of the counterclaim to stand since they increase the amount sought from IBM from \$5 million to \$15 million.

In reaction, IBM said, "We feel the antitrust counterclaim was totally without merit and are pleased the judge denied Catamore's motion on this point."

On the Inside This Week

Privacy Laws Should Meet Needs of Local Areas

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Increasing On-Line Uses Require Special Care

By Patrick Ward

Of the CW staff

HARTFORD, Conn. — Now that DP users have come to depend increasingly on on-line systems, the danger they face from power outages or brownouts has become even more significant, panelists at a power supply symposium here agreed.

"We all strive for stable, constant power, but we're not always going to have it," David H. Berg, vice-president of the Hartford Insurance Group, told attendees at the symposium held at the Aetna Life Insurance Co.

The user's need for a stable power supply is greater all the time because of increasing computer dependence on DP and because of the trend toward remote sites which have no alternative if the central CPU is down, Berg observed.

And the trend to large CPUs in a multiprogramming environment is "putting a lot of eggs in one basket," he added.

"Each user should critically evaluate his applications, especially those involving teleprocessing or a data base," to minimize the effect of power failures, said John Roberts, manager of environmental responsibility with IBM.

Roberts said IBM had conducted extensive monitoring tests in the late Sixties and early Seventies to determine what sort of power supply problems its users would have to deal with, and then used the data for simulation tests with its computers.

The firm may start a new round of monitoring to see if the power supply situation has changed much in the meantime, Roberts added.

A power loss not only brings the computer down, Berg reminded the attendees, but also its environmental and security support.

So a DP manager planning to handle power breakdowns should plan closely with his firm's air conditioning, elevator and security people, as well as his vendor and utility

(Continued on Page 2)

Living With Power Shortages

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So a DP manager planning to handle power breakdowns should plan closely with his firm's air conditioning, elevator and security people, as well as his vendor and utility

(Continued on Page 2)

Strike Endangers West's Paper Supplies Users Urged to Cut Consumption

By Marvin Smallheiser

CW West Coast Bureau

LOS ANGELES — Users in the West face a cruel temporary use of routing slips to increase the mileage obtained from one-part printouts.

The strike began May 6 and a Boise Cascade spokesman said negotiations have been broken off since the company's last offer.

No progress has been made in negotiations, according to the striking union, the Association of Western Pulp & Paper Workers.

"Pretty Serious"

Thomas McLemore, western division manager of Uarco, a leading business forms supplier, described the situation as "pretty serious."

He said Uarco has had to reduce sales of printout paper by a substantial amount and if the strike goes on another two to three weeks, Uarco will probably have to cut it off completely.

"We advise users to make sure any reports are necessary and defer reports they can until the strike is over and cut down the number of copies, if possible."

"One of the best tricks is converting a printer from six line/in. to eight line/in.," he said.

Another business forms supplier said the situation is "verging on the extremely serious."

He urged temporary use of routing slips to increase the mileage obtained from one-part printouts.

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No progress has been made in negotiations, according to the striking union, the Association of Western Pulp & Paper Workers.

On Government-Wide Basis

GSA Office to Push CPE

By Don Leavitt

Of the CW staff

ATLANTA — The General Services Administration (GSA) plans to establish a performance evaluation office to "meet the need for a government-wide program aimed at improving the performance of computer installations," according to Warren E. Burton, deputy GSA commissioner.

Keynoting the recent meeting of the Computer Performance Evaluation Users Group (CPEUG), Burton gave no time-

Dan Curtis, district manager in Los Angeles for Vanier Graphics Corp., a West Coast forms supplier, said the shortage was "very serious" over the strike, ever since ecology programs forced the closing of mills because of river clean-up regulations.

He said an extended strike could force suspension of some computer operations and the only alternative now is to use paper more wisely.

"We're looking for data processing coordination and control for Occidental

(Continued on Page 4)

table for the setting-up of the new office. Once in place, however, it would "encourage" the increased emphasis by top managers on the use of computer performance evaluation (CPE) techniques, he said.

Power to Push

The new office will apparently have power to push where pushing seems needed. The office is aimed at "ensuring" federal agencies' use of performance improvement techniques, in both the acquisition of new equipment and in the "preparation of comprehensive and detailed guidelines" for the agencies to improve the performance of operational DP installations, Burton noted.

This effort will complement the operational capability of the Federal Simulation Center (FedSim) "which identifies dramatic savings in DP expenditures through individual CPE projects," he added. It would also appear to complement the efforts of the General Accounting Office to make CPE part of the audit procedure in most government DP installations.

By collecting, categorizing and circulating performance evaluation findings as they are individually developed, they can be "applied to similar DP operations" on a government-wide basis, the keynoter explained. He did not elaborate on the ways in which the findings might be

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Printers Assured Lifetime Jobs Despite Total Paper Automation

By E. Drake Landell Jr.

Of the CW staff

NEW YORK — The threat of worker displacement by automation was clearly highlighted last week in a contract agreement between printers and the two major daily newspapers here.

Under the 11-year contract signed between the *New York Times*, the *New York Daily News* and the *New York Typographical Union* Number 6, the papers will be allowed to fully automate their printing operations, but will have to employ jobs to all union members for their lifetimes.

The settlement, which would set a precedent, was reached after almost 14

months of negotiations, during which the issue of automation was the most controversial.

The negotiations were marred by a strike, or lockout, at the *Daily News* which occurred after union members refused to handle computer-set type. The *News* was forced to turn to a computer system to publish — possibly the first use of a computer system as a "strikebreaker."

More to Come?

The clash between the printers and publishers here may be a prototype of future conflicts, observers said, that will arise

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Help Set Policy, Implement It

GMIS Urges 'Local Participation' in Privacy Legislation

By Marvin Smalheiser

LONG BEACH, Calif.—Legislators grappling with privacy and security legislation were urged to make some provision for local involvement in the implementation of that legislation.

The plea came from speakers at the spring conference of the Government Management Information Sciences (GMIS) users group around the Queen Mary.

Andrews O. Atkinson, executive director of GMIS, asked for "greater local government participation at the policy-making level."

Atkinson also advocated a local information systems board to facilitate the management of any bill that is eventually passed.

Establishment of a general right to privacy as opposed to multiple legislation for specific privacy problems was also asked by Atkinson.

GMIS has its own model legislation for a fair information practices act which is

similar in many respects to many other bills, although Atkinson said other bills lack local representation on the policy board and advisory committee.

"Since most information stored at the state and federal levels originates from local sources, it is important that local governments have a representative role on boards and/or committees created by federal legislation."

Gene D. Hill of the University of Colorado, who recently completed a book on guidelines for security and privacy, also urged public participation and commitment in privacy legislation.

Dial said however, that "people aren't aroused about privacy as some of our leaders would have us believe."

"Most people will sell their right to privacy down the drain to get a loan, a mortgage or driver's license."

He said he favors a board with representatives of government, the media, civil libertarians and attorneys to learn the ramifications of procedures at the local level.

The line between security and privacy has to be drawn locally," he said.

Richard Seymour, DP division program manager—data security and privacy of IBM, spoke about Project Safe (Security Automated Facility Environment) and said the computer may be the only practical way to meet some of the objectives of legislation such as logging access and keeping track of records.

"We need most to be concerned with the insider who needs to know information," he cautioned.

"It's the determined insider who is the real problem and is most often involved

in misuse."

Seymour said the Safe study results have not found any magic or breakthroughs but rather confirmed many earlier ideas.

A secure system, he said, was found to be marginally more expensive to run, and not significantly more expensive.

"The secure system was more reliable and efficient," he said.

The installation task, Seymour said, is

Funds Sought for Clearinghouse

(Continued from Page 1)

The goal of the clearinghouse project, launched earlier this year [CW, March 27], is to select existing application packages and modify them into common packages that could be transferred from one state or local government user to another.

Where no existing package could be modified, a new one would be developed. Funding is the biggest problem now in pushing ahead with the program to set up the clearinghouse, said Atkinson, who spoke at the GMIS spring meeting here aboard the Queen Mary.

"To get the program in operation we need two to three full-time technical personnel dedicated to instituting the national center."

Vendor response to the effort to increase the transferability of existing packages, Atkinson said, has been to offer "guarded support."

But he said he is optimistic that GMIS will make definite progress with the project this year.

more like a major application than a new release of OS.

Generally, he said, the user is "not sensitive to basic risks or protective measures and resists any reduction in utility."

Education is required for users in installing security measures. Seymour added that users generally opt for usability over security.

The Safe study will be available in July or August, he said.

GMIS membership is unified behind the project, he said, and there has been sufficient endorsement from vendors so that "significant progress can be made."

As an example of efforts being made among individual users to increase transferability, Atkinson cited the plan in Cincinnati and Hamilton County, Ohio, to convert existing, proven programs into a highly transferable form on new Burroughs equipment using transfer strategies developed in GMIS research studies.

"This way, programs we have developed will have a high degree of transferability," he said.

He said he feels other users will do the same. But it cannot be effective without a clearinghouse to establish training procedures and institute documentation."

Atkinson said he feels it is possible to elevate technical transferability well above 90%.

He emphasized the need for vendor involvement and support to develop transfer strategy and to advise on the usability of their software systems.

Power Critical for Increasing On-Line Applications

While, he said, if problems do come up, the system should be able to contain them. Only a part of the DP equipment goes down.

New England Safe

HARTFORD, Conn.—New England area DP managers should not have to worry about power outages and brownouts this summer, Albert LaPlant, manager of communications and development for Northeast Utilities, told a recent power supply symposium at Aetna Life Insurance Co. here.

LaPlant said New England utilities have the capacity to meet user demand in the absence of a string of unexpected coincidences such as extreme use of cooling equipment, unusual drought and excessive power plant breakdowns.

In the internal design, Starr noted, the DP manager has to take account of additional loading in his building.

"Of course, it is desirable to completely isolate the system's power, but this can cost more and so it may be frowned on." And it is not always a necessary step, Starr noted.

DP managers also have to determine, both on a dollar-and-cents and a "best-of-the-parts" basis, whether they need any sort of buffering to improve the quality

of the utility power coming into their computers, he mentioned.

Uninterruptible power source booster auto transformer which can raise voltage by a specified level during a brownout; and a solid state voltage regulator and electric motor generator, which take the utility's power and produce a constant voltage level for the computer's use.

A diesel-powered generator can produce power for both CPU and environmental support during a long outage, and an uninterruptible power supply (UPS) can both electronically filter incoming voltage and provide a battery for orderly CPU shutdown.

All these alternatives cost money, and the UPS especially can add 20% to the computer system's power consumption, Starr noted.

Can the utility's past good performance necessarily be a guide to the future? Starr questioned. No one expected the great Northeast blackout, he recalled.

An attendee remarked it wasn't enough to have a generator on hand. Users must regularly test and maintain them too. Albert LaPlant of Northeast Utilities agreed, mentioning that 30% of the users who had generators before that famous Northeast blackout could not start their equipment because of a lack of preventive maintenance.

LaPlant, who is manager of communications and development, energy consulting services department, notes his utility provides a power network in central Hartford with multiple cables and transformers backing up a customer's power supply. If one cable were to go down, the customer's service would be unimpaired, he said, adding this network concept is the accepted practice for utilities serving central cities.

On the fringe areas, though, the power customer usually depends on a single cable and transformer. The order of optional backup and switching capability if he wants it.

Obtaining this backup is more difficult in a rural area, he mentioned.

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representatives, Berg said.

Legislation such as this exists both on the availability of hardware and the people necessary to support it, he noted, and also on how long it will take the user to catch up on his workload.

"Once we have a system we can work with, do we know which job is more critical? Do we have a game plan? Do we know which machine we are going to bring up first?" Berg asked the attendees. Contingency plans ought to be in place well ahead of time, with prepared procedures ready just like a fire drill routine, he said.

Technical Alternatives

A DP manager has a number of technical alternatives in safeguarding his power supply. Sam Starr, a partner in Jansen & Rogan, consulting engineers, told the group. One of them is monitoring both the firm's external power supply and the internal supply serving the DP system. Problems can occur in either one, he mentioned.

However, he noted, the ability of DP equipment to handle power line problems and outages has improved over the years and a lot of the more sensitive equipment now has its own voltage regulators.

DP managers should try to design their in-house power systems as well as pos-

sible, he said. If problems do come up, the system should be able to contain them. Only a part of the DP equipment goes down.

The key difference between the two bills concerns an amendment passed by an overwhelming Senate vote that would deny federal funds to local districts or colleges that prohibit a parent from inspecting all records on his child, including computer records.

While no estimate is available to indicate

what percentage of pupil records are computerized, certain specific types, such as test scores and truancy records, are almost always computerized, according to William E. Biederman of the American Civil Liberties Union Project on Privacy and Data Collection.

Right to Challenge

Under the Senate amendment, parents also would have the right to challenge and correct records, and a right to give consent prior to disclosure of files.

Open School Files Key to 2 Bills

WASHINGTON, D.C.—House and Senate conferees will meet next week to resolve differences in bills authorizing federal funding to local school districts and colleges.

The key difference between the two bills concerns an amendment passed by an overwhelming Senate vote that would deny federal funds to local districts or colleges that prohibit a parent from inspecting all records on his child, including computer records.

While no estimate is available to indicate



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In fact, a 3673-controlled string may be connected directly to a Model 125 DDA or a Model 135 IFA, when you upgrade from IBM 2311, 2314, 3340, 3333/3330 or 3830/3330 systems on small computers.

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MEMOREX

N.Y. Printers Have Lifetime Jobs, Despite Computer

(Continued from Page 1)

when automation equipment can be used less expensively than human workers, therefore causing dislocations in the present workforce.

The clash between the union and the publishers—called a "collision of union and management compulsions" by labor reporter A.H. Raskin of the *Times*—was basically a fight for survival.

Several mainly nonunion newspapers over the past few years have been automating their printing operations, often slashing costs even though there have been several false starts in the area.

However, in New York the union won the right to block automation efforts after a crippling 114-day strike in 1962 and 1963, a decision the publishers of the papers here have since regretted.

Faced with rising labor and other costs, the publishers felt they had to automate their printing operations in order to survive, but the union felt itself threatened and its future clearly in doubt if the automation was allowed to proceed.

"What is new in the present discord is the conviction of both sides that the outcome literally will determine their institutional future—even whether the papers or the union have a future," Raskin wrote before the contract was negotiated.

"For the publishers, the 'must' element in these negotiations is a free hand to introduce computerized typesetting and other forms of automation into their composing rooms, still geared to technology that has remained fundamentally unchanged since Ottmar Mergenthaler invented the Linotype machine in 1886," Raskin said.

"For the union... one of whose members operated the first Linotype ever to set an article for newspaper use—the projected changeover raises fear not only of the destruction of jobs and prized skills but also of the organization's own consignment to the slag heap," he added.

With these economic and psychological drives behind each side, a settlement seemed almost impossible—a situation severely aggravated when the *Daily News* moved automation equipment into its New York City plant, which led to a 17-day walkout on the part of the typographers.

The paper continued to publish, however, moving completely to an automated system, leading union members to call the computer system a "scab" or strike-breaker.

The break in the negotiations came last week during an 8-1/2 hour bargaining session, but still has to be ratified by union members.

Called an "occurrence of tremendous importance" in the history of collective bargaining by labor mediator Theodore W. Wheel, who helped work out the pact, the agreement includes the following.

• The papers will be able to employ "any technological device to increase the efficiency of their operations," and are under no manpower restrictions in the operation of the equipment.

• About 1,800 of the 2,100 union members of the two papers will receive a "lifetime guarantee of employment" and couldn't be fired for any reason, even though they could be suspended without pay with the length of the suspension determined by arbitration. Reductions in the workforce can only come through attrition.

• In order to encourage retirement of printers, the newspapers agreed to offer

all printers a "six-month productivity leave" after which the printer could return to work if he didn't find other work.

• Printers who retire within six months of the contract verification would get a \$2,500 bonus in addition to the six-month leave with pay.

A host of standard wage increase proposals was also included in the agreement.

Presently there is no standard retirement age for printers at the papers and none will be imposed. The average age of the printers affected by the agreement is 56, the union said.

The *Times* and the *News* both said they would start moving in automation equipment to handle their printing functions immediately upon ratification of the pact.

GSA Office to Push CPE Methods

(Continued from Page 1)

"applied," not on what characteristics—CPU, operating system, workload—would be used to recognize "similar" operations.

Although the GSA project is intended as direct support for government installations, its findings will "undoubtedly" become available to the general DP community, "through channels such as CPEUG, Computerworld and EDP/Performance Review," one of Burton's listeners remarked later.

In addition, the listener noted, once government installations really start pushing for more effective hardware and software, the entire DP community should reap direct benefits.

Mixed Feelings

Burton set the stage for his announcement of GSA's new effort by saying he was both proud of the past accomplishments of the CPE professionals and disappointed by them.

"Your efforts have resulted in millions of dollars in savings, and a continual shortening of the DP acquisition cycle," he admitted.

"But we've hardly scratched the surface of potential savings," Burton said, dropping the other shoe, "because performance evaluation has not been sold to agency policy makers and financial managers."

"We know that often for an investment of \$50,000, performance evaluation can save hundreds of thousands of dollars. But before we can produce savings, someone has to stake us. And that stake has to come from the top—from both policy and budgetary sides of the house," Burton said.

Educate Top Managers

"We have to educate top managers in a language they can understand—dollars and cents, and return-on-investment," he noted.

Burton was filling in for M.S. Meeker, the GSA commissioner who heads the Automated Data and Telecommunications Service, in which the new CPE support-office will be located.

About 40 people from government and "civilian" DP installations attended the two-and-a-half-day CPEUG meeting at the Sheraton Baltimore Hotel.

Strike Endangers Paper Supplies

(Continued from Page 1)

Life Insurance Co., reported a cutback in paper used throughout the company and said it is trying to find firms that can recycle it.

He said the company is also researching the 1,600 applications at the data processing center to find those that use large amounts of paper. The idea is to put as many as possible on microfilm and microfiche.

The company has already gone from six line/in. to eight line/in. printers and is using an experimental printer that uses 8-1/2 in. by 11 in. paper.

Dug Tamara, general manager of the Data Service Bureau, (DSB) of the City of

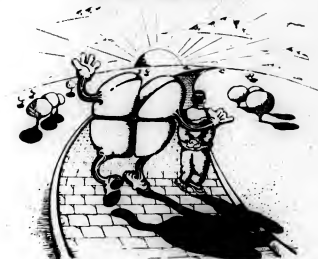
Los Angeles, said while the strike hasn't affected supplies yet, DSB is reevaluating more extended use of computer output microfilm and new printers using less paper.

Costs Rising

"Paper costs are up 30% to 40%, lead times are longer and we are carrying longer inventories," Tamara said.

R.L. Janssen, assistant to the director of corporate information services, Union Oil Co., said, "We have no problem but we are doing volume buying to anticipate a paper shortage. The only problem is a little delay in receipt of deliveries so we have to give a longer lead time on orders."

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capacity in 100-megabyte single-density increments with our new single-spindle 3670-2 disc drive module.

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high compared with the 3340. You'll get 50% more capacity per drive at about 80% less cost per disc pack, and avoid an extra conversion of your data base to an interim device that you will out-grow in the foreseeable future.

Besides, Memorex doesn't charge for rotational position sensing. That's one of many no-extra-cost third generation advances in the 3670 system.

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MEMOREX

Well Under Theoretical Limits

Survey Finds DOS, OS Multijobs Average Just Over 2

By Vic Farmer

or the CWA staff

CHERRY HILL, N.J.—Multiprogramming users with 70% or more batch operations may be deluding themselves if they think they are coming anywhere near actually utilizing the theoretical limits of 15 jobs and 3 partitions for OS and DOS respectively.

In a survey of 31 IBM 360 and 370 users taken recently by Value Computing, Inc., the average number of jobs running at all times was slightly over two.

"Of course, you must take into consideration the operating system storage requirement, and the type of work being processed," Vincent J. Bannan, president of the software firm, cautioned, "for these factors do have an effect on the multiprogramming concurrency levels."

Operations people feel they may be running well ahead of this average but the cold hard facts will probably disprove it

when users tally and average a month's worth of operation statistics," he added.

Three Groups

The survey was divided into three groups of respondents: 19 OS users with at least 70% batch production and at least 5M bytes of memory, 12 DOS users with at least 70% batch production and no special core requirement, and 18 OS and DOS sites operating in less than a 70% batch production environment.

The overall average of all three groups was 2.78 jobs running at all times, but this figure was skewed by the third group of users operating less than 70% batch. This group often has a high percentage of testing and remote job entry, according to Bannan.

The first group—OS and 70% batch or more—showed a disappointing average of only 2.34 jobs running at all times, according to Bannan. And the high in this

group was 4.08 average. Bannan attributed this poor multiprogramming average to an attitude by many programmers that under OS, programmers do not overly concern themselves with core and peripheral constraints to the same degree as DOS programmers.

In a sense, the programs are written almost ignoring any attempt to conserve or tighten the applications operating requirements.

A Better Average

The DOS group had a better average of 1.8 jobs in comparison with the theoretical limit of three partitions available with standard DOS. Here, in this group, two companies maintained a high average of 2.99 jobs concurrently.

"It should be clear that in a standard DOS system as it comes from IBM you could probably never achieve this measure of concurrency," Bannan noted.

The high utilization rates are due mainly to the use of proprietary software that serves to broaden the number of partitions and possible levels of concurrency. In the last group—users without 70% batch restrictions—the group average was much higher at 3.9 jobs running at all times, with a user scoring a high of 8.84. "If operations are not constrained by large interrelated job streams with predecessor relationships, user-time requirements and special file setups, a multiprogramming system can achieve a greater degree of multiprogramming," Bannan explained.

Operators at Site

As a sidelight, one of the questions on the survey asked how many operators were at the site and how many tape and disk drives were installed. The average of all users surveyed revealed one operator was normally assigned to handle six peripheral devices per shift. But this measurement had wide extremes that ran from one operator/two devices to one operator/12 devices.

Bannan also noted that results of a similar survey among users of his company's computer scheduling and control system indicated a 30% better multiprogramming concurrency than users who relied on operator intuition.

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Effort to Sell Viatron Unsuccessful to Date

BOSTON—Viatron Computer Systems Corp.'s court-appointed trustee [CW, April 17] has been unable to sell the company as "a going concern."

Boston lawyer R. Robert Popeo, who has been operating Viatron as its trustee, solicited bids from other companies to buy Viatron.

Proceeds would go to the company's creditors, whose claims total over \$20 million.

However, Popeo said the bids he received were "unsatisfactory."

A group of Viatron debenture holders presented an alternate plan of reorganization under which most creditors would receive a new issue of Viatron common stock as payment.

There will be a hearing on both matters in federal court in Boston June 12.

Viatron has been in bankruptcy proceedings since February 1971.

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Direct attachment of Memorex 3670 Disc Drives to System/370 Model 125 DDA and Model 135 IFA is now possible with the new Memorex 3673 controller. Attachment to the larger System/370 processors—Models 145 and up—is accomplished with the new Memorex 3672 Storage Control Unit. At last you can choose an independent's disc drives and still gain the advantages of the IBM 3330 enhancements, including string switching and double-density.

For the user whose data base requirements increase at a gradual rate, Memorex now offers the ability to build string capacity in 100-megabyte increments using the new Memorex 3670-2 single-spindle Disc Drive Module.

Of course, all significant features of the IBM 3330 line are provided—writable control storage, rotational position sensing, error correction code and command retry, disconnected command chaining, multiple requesting, record overflow, and write format release. In addition, you get a faster average access time, and the industry's most advanced Field Support capability, including extensive in-line microdiagnostic support and an on-line diagnostic software system. This allows the 3670 System to increase throughput by better performance and to minimize the requirement for dedicated systems maintenance (most drive problems can be diagnosed and corrected while you, the user, continue utilizing the other drives in your 3670 Disc Storage System).

Furthermore, the reliability of all critical components has been field proven. We make them ourselves, from the heads through the motors to the control unit's flexible disc drive. All critical components have been in use since we introduced the 3670 System's single-density units in 1971.

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MEMOREX

Two Managers Tell Seminar

More Responsibility, Better Pay Hold DP Operators

By Patrick Ward
Of the CW staff

CHICAGO — More responsibility and better pay can prevent the loss of experienced computer operators to other positions, two speakers at a recent seminar here agreed.

Eugene V. O'Halleran, senior manager of computer operations at Chicago's Blue Cross Association, and Jack Graham, DP manager for Franklin Life Insurance, described the steps their installations have taken to keep their operators.

O'Halleran considers good, experienced operators such an asset "that it blows my mind when an operator goes to programming for \$1,500 a year."

"Nine out of 10 [operators] who go into programming would rather stay in operations, but the money is in programming," O'Halleran commented.

The association urges the experienced members of its 14-man operations staff to

make decisions on their own, and not wait for supervisors, he said.

Not all operators take part in diagnosing problems, he noted, but they gain this capability as they go through training.

Besides participating in management and supervisory work, the association's computer operators also form part of the teams that go to remote sites to install terminal equipment and train people there.

Who's Needed More?

But "we do it reluctantly," O'Halleran noted, because he said he can't take an operator off the job for a day as easily as he can a programmer.

Though Blue Cross Association computer operators have a formal review once a year to determine pay, the association also holds bimonthly evaluation sessions with the operators to keep both supervisors and operators in touch with the

operators' strengths and weaknesses.

If he had his own way, O'Halleran said, operators would be paid as much as programmers.

Operators even do some rating of work by systems and programming people, O'Halleran noted.

Starting salary for operators in his installation was \$120/week two years ago, O'Halleran stated, but it is now about \$155 and he is hoping for \$175 soon.

Jack Graham of Franklin Life Insurance feels his firm has given operators "more decision-making, more voice in the way things should be done."

At Franklin Life, computer operators are twice as likely as any other group to earn money in the company's suggestion plan, he said.

A senior operator at Franklin Life can follow one of three career paths, Graham noted. He can become a shift supervisor, a systems programmer (trainee or he can

turn to applications programming — a sideways step financially, Graham noted.

Graham and O'Halleran had different approaches to the problem of getting their firms' top management to forecast their expected DP needs for the next two to five years.

O'Halleran said the vice-president in charge of DP and others in the department first formulate a plan on what the company should and would be doing in five years and then the plan would cost, and then submit the plan for approval.

At the Blue Cross Association, the vice-president of DP and telecommunications services takes part in the association's strategy meetings for the next year or more and then comes back for "skull sessions" with the department to judge how the plans will impact their work. If top management approves the DP department's assessment, "that's the strategy we follow," O'Halleran noted.

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Simulation Models Cause Controversy Over Freeway Plan

By Robert Glass

Special to Computerworld

SEATTLE — A series of computerized simulation models used by the Puget Sound Governmental Conference (PSCG) to make population distribution forecasts is smack in the middle of a freeway controversy here.

The programs themselves are not being challenged, but the results have become a political football between pro- and anti-freeway advocates, and between city and King County officials.

King County executive John Spillman, convinced of the need for an expanded Interstate 90 highway link across Lake Washington from suburban Bellevue to Seattle, lashed the PSCG report on the grounds that it "skipped over too lightly" the relationship of I-90 to Seattle.

The PSCG report, requested by the Washington State Highway Commission after years of Seattle freeway opposition, has virtually permanently stopped I-90 construction, showing that the construction of I-90 would have only slight impact on the affected areas. By 1990, the population impact as computed in the report would be only about 4%; the job impact, 2%; and the travel impact, 19%.

However, in a position paper accompanying the report, PSCG noted its "reaffirmation" of a "past commitment" to I-90, based on the "critical need for improving traffic safety and dependability of service in the I-90 corridor, and on the need for transit."

I-90 is particularly controversial, because it follows the route of Seattle's famous floating bridge across Lake Washington, and because it involves considerable cutting and filling.

The expansion plan for I-90 involves adding four high-way and two transit lanes. Several simulation models served as the basis for the PSCG report, according to Tom Byron of PSCG's Research Division. Transportation data was generated by U.S. Department of Transportation programs, using Seattle input data describing road network intersections, speeds and capacities.

Economic base predictions were made using a model for the Puget Sound region based on similar programs used by other cities.

But the allocation of results to municipal regions, from which the "minimal impact" data emerged, came from an activity allocation simulation model called Empiric, developed for PSCG by a computing software firm. PSCG's use of Empiric relies heavily on census population data, and on employment land use and origin-destination data developed by PSCG for the Puget Sound area.



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Editorials

A Two-Way Voice

The Aflips board of directors was well advised to kill the idea of an Information Processing Board to interface with government leaders—but this move should not stop the organization from establishing some sort of Washington presence soon.

The Information Processing Board idea involved essentially one-way communication—from government personnel to the heads of the Aflips constituent societies. That may well have been ego gratifying to those involved, but would hardly have provided the computer community with a voice on the national level.

That voice is needed—now. But it must be effective, well-funded and involve two-way communication between government officials and the computer community.

The responsibility is clearly with Aflips and we hope the organization will be able to come up with a well-thought-out, effective plan in time for its next board meeting.

Nagging Thought

A nagging thought persists regarding a statement made during a privacy session of the National Computer Conference.

The proprietor of a credit bureau reported that the Fair Credit Reporting Act, which became law three years ago, brought a 100-fold increase in consumer inquiries. Ostensibly, many of these inquiries came from people who had been denied credit, but who did not realize the reason was the existence of a negative report from the bureau.

The proprietor boasted that "only one third" of the 200,000 yearly inquiries resulted in corrections (and only 1/20th of those who had been denied credit actually inquired!).

Where are we going with that error rate of 33% on a scale that great is even tolerated, let alone considered exemplary?

Uxbridge

Three hundred and fifty years ago Isaac Walton wrote about fish and fishermen, at an inn on the banks of the Thames at Marlow. I chose to stay at that inn, now a luxury country hotel called "The Compleat Angler," and to drive in some 20 miles to the European Computing Congress at Brunel University in Uxbridge. The lilacs are out, and vast numbers of towering chestnut trees are in blossom. Ducks quack, and eat pieces of my breakfast toast, at the foot of the lawn.

A greater change from Chicago and the Palmer House one could hardly imagine. And of course Eurocomp is also different: smaller, younger, more at a technical university with most exhibits in a tent structure. The sessions for papers, though, run about the same: great titles and abstracts, moderate content, pulled discussion.

Important to me because of my Caravan and NCC connections, and of course vital to the conference organizers here, is the disappointing attendance. As at the famous Hannover Fair earlier in the month, far fewer people showed up than were expected. Wasn't the exhibits, in either case. At Brunel there was a richer IBM show than at Chicago: three complete System/3 installations, a big System/7, much new disk stuff, and lots of other ancillaries—including some gear from IBM France. Burroughs had a nice 1700, NCR was out in full force with its MOS-built 151, Xerox (Rank Xerox here) had a handsome stand. Honeywell was present, which it was not in Chicago.

One novelty was a signature verification system from NPL—pause here, to watch a sweat glide by the river outside my window—that's the National Physical Laboratory, like our NBS. Would

work with a microprocessor in practical application, plus one or more sensitive elements called Datapads.

The booth birds wear attractive identical costumes at European shows: black and white for Burroughs, brown (I) for IBM, and so on. They exercise their feminine wiles much more discreetly than in McCormick Place, but they do exercise them. Also I'm somewhat of a foot fetishist, and the far-out footgear gives me fits!

The glory of Brunel is not its buildings which, although quite new, are already badly chipped; not its tents or its parking lots, certainly; not even its small but well-known computer service facility. It is a chief named Eric, who does the greatest reception buffets in the business—not just for computer people, of course, but for other university functions as well.

The high point of English visits for me is always seeing friends, in town as well as at conferences. They ranged this time from Nancy Foy, whom I had been with only six days before at the NCC, to Basil de Ferranti. Not to mention a Brunel security guard who remembered giving me a warning notice two years before—and Eric!



Heck Groch



'Mark My Words! The First Three Things They're Going to Do With It Are Figure Out How to Beat Bobby Fischer, Design a Car That Runs on Borsch, and Join Our Tracking of Their Tracking of Our Spy-in-the-Sky!'

Letters to the Editor

Century Upgrades Cause No Problems

Heb Groch appears to be skeptical about the ease of upgrades in the NCR Century family of computers. Let me relate our experience and he can judge for himself.

Our 16K Century 100 had been in operation for a about four

years. Our decision to upgrade to a 32K Century 200 system created quite a furor because most of us involved had been through at least one upgrade with IBM and Univac equipment. None of us were aware of the problems we could encounter but we were extremely apprehensive because of traumatic past experiences with other manufacturers.

Our client files (approximately 1,000), programs (approximately 800) and control strings (approximately 150) were contained on 42 active 655-type disk packs. Our new computer would have the same type of disk drive but we still had many reservations.

We arranged with NCR to move our Century 100 to another area over a weekend and then to set up the Century 200 in our regular computer room.

The Century 100 move was accomplished on a Saturday and the Century 200 was delivered on a Monday. On Thursday afternoon the Century 200 was certified ready for use. Because we were in our busiest period of the month and the Century 100 was loaded down we threw caution to the winds and decided to convert to the Century 200.

Total conversion time—three minutes.

- Conversion procedure:
1. Remove disk packs from Century 100.
 2. Mount disk packs on Century 200.
 3. Start up Century 200.
 4. Run.

When we had the chance we recompiled programs where the instructions were a hardware feature on the 200 and a software feature on the 100, or programs which were overlaid because we were running 20K to 30K programs on a 16K system.

Some programs have never been recompiled because we took advantage of one of many of NCR compile options. When we decided to upgrade we made it a standard for all programs

compiled on the 100 to also generate the alternate 200 hardware instructions. The program memory size requirements were increased slightly but the program would run on the 100 using 100 software or on the 200 using 200 hardware.

Would you believe—upward and downward compatibility!

Our biggest problem, in fact our only problem, was to get NCR to move the Century 100 from our premises.

D.L. Syria
Western Computing Ltd.
Edmonton, Alta.

Mistakes Corrected In Review Manual

We read with interest "Some Not-So-Nice Words on CDP Examination" contained on Page 14 of the May 1 issue.

Regarding the complaint about mistakes in the *CDP Review Manual: A Data Processing Handbook* (New York: Mason & Lipscomb Publishers, 1972): The first edition of any publication invariably contains a few minor errors. We are endeavoring to correct such errors in the revised edition which will be published in the near future.

The MacGowan-Henderson *CDP Review Manual* contains three paragraphs describing breakeven analysis: on page 174 in the chapter on general management, on page 374 in the chapter on accounting and on page 435 in the chapter on mathematics.

We would appreciate receiving an elaboration of the criticism which apparently pertains to one of these paragraphs. If this individual wishes, he may write to us directly.

Reid Henderson
Roger A. MacGowan
Compudemics, Inc.
10560 Main St.
Suite 202
Fairfax, Va. 22030

(Other viewpoints on Pages 11 and 12.)

Professional Practices

Algorithmic Cobol Increases Efficiency, Reduces Error

By Richard S. Heiser
Special to Computerworld

The Cobol programmer has been persuaded that general-purpose routines, such as various Fortran algorithms, are not for him, because "all Cobol jobs are different." This simply isn't true. The difference between the typical time-saving Fortran algorithms such as matrix inversions, etc., and Cobol algorithms is that the generality in Cobol is in the top level of the program rather than in the subroutines.

The Cobol top-level logic is a lot of repetitive file logic — the type of thing which RPG provides in a limited manner. If we can place this repetitive area into general algorithms, then we will be able to increase the productivity of Cobol programming, and just as importantly, allow our managers to actually read our programs.

Currently, Cobol programs are too hard to understand, even with listings, explanations and flowcharts. Nobody can understand them, not even their authors.

That is why programs contain serious errors which often are undetected for months.

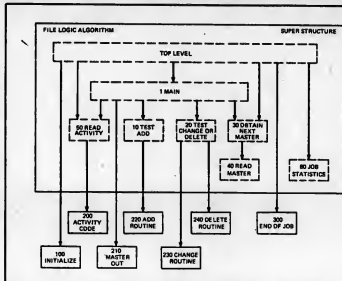
But, algorithmic Cobol programs could be read. Using algorithms, the programmer can know that someone understands it, that someone promises that it works, and that someone invites rebuttal. Algorithms, therefore, are worth reading.

Example of Cobol Algorithm

Take as an example, the file logic algorithm shown in the figure. This is a general-purpose file update program, applying activity transactions from one file to a master file, and producing an updated master. The program assumes both input files are in sequence on a key which appears in every record, and that the individual records have unique keys. It examines the master file first, although it would be equally proper to examine the activity file first.

Functional features of this particular algorithm are:

- Out-of-sequence transactions will not be processed.



The figure shows the structure of the described Cobol file logic algorithm. The actual program as tested has three File Control statements, 27 File Section statements, 11 77-level Working Storage values, eight Perform entries into 14 procedure paragraphs, including dummy handling of transaction handling.

- Attempts to add records that already exist will be detected and reported.
- Attempts to change or delete records that do not exist will be detected and reported.

Processing will continue after such defective transactions have been encountered. Record counts for all three files will be reported.

- Error counts will be reported.

Technical features of the algorithm include:

- The input and output areas normally contain the same master file record.
- When a new record is to be added, the output record is cleared and set to the key of the add record. At the same time, a flag is set to indicate an unprocessed master is waiting in the input area.
- Records being added can optionally

be changed after being added (perhaps multiple times).

- Multiple transactions for a single key must appear in add/change/delete sequence.

Using the Algorithm

The algorithm has been designed for convenient modifications to a specific application. Changes are grouped together and marked. The user should modify the File Section entries for his particular application, keeping the same names for files, records and keys, but changing the file descriptions and record field to suit his needs.

All user-coded procedure statements are at the end of the program, in paragraphs numbered 100 or higher. The user routines should not do any master or activity file operations.

Only these paragraphs need attention from the user programmer.

Examples of areas where the user can add his particular procedures include:

Initialization — such as opening report files, write a first page heading, etc. Place in Paragraphs 100 — 199.

Transaction-Editing — including defining particular transactions as being proper for adding, changing or deleting, or not to be processed. Place in Paragraphs 200-209.

Control-Total-Reporting — and other tidy-up operations after the update is completed. Place in Paragraphs 210-219.

There are several advantages in the use of algorithmic Cobol. Most important, the algorithm is accurate. It has been carefully checked by the author, by evaluators and by other users. By contrast, homemade programs are checked less completely and are rarely seen by more than one person.

The algorithm is productive. Richard Hamming has said that although a scientist like Gauss stands on the shoulders of giants, we programmers are stepping on each other's toes. Is there any reason to recreate this program every few months? Using the algorithm is RPG-quick.

The algorithm is efficient. Due to careful design, the movement of records in core is minimized and the program is shorter than many hastily written update programs.

The algorithm is capable. It can apply all three types of transactions separately or in combination to the same key. It checks for and recovers from error and maintains statistics. User processing is in Cobol with full control of conditions and exceptions.

The algorithm is understandable. The user interfaces are clean and "narrow." Because the program uses structured programming techniques, the flow of control is disciplined and the program is believable.

Richard S. Heiser is employed at Litton Systems, Inc., Data Systems Division, Van Nuys, Calif.

Additional Work Necessary on CIA User Group Offer

The Computer Industry Association recently offered \$50,000 in seed money to start up a "no-strings" computer user group. This is a laudable aim, and one which the Taylor Report has supported for some time. Unfortunately, the way the current offer is formatted makes it impractical or unrealistic to expect the conditions to be met.

The basis of the CIA argument is that there are no such organizations for users today and that one is needed. I have no argument with that one.

But then the CIA goes on to say it will not put up any money unless two organizations are found, which are also prepared to put up \$50,000 on a "no-strings" basis. If there were such organizations in the field (in conversation it was suggested that the Computer and Business Equipment Manufacturers, or the American Federation on Information Processing Societies would be possible organizations), then frankly they would already be the "no-strings" organizations which the CIA rightfully points out do not exist.

So, for practical purposes the CIA offer is being conditioned upon a denial of the asserted need for it.

There are some other conditions also, regarding acceptability of by-laws, mem-

bership of some large installations, etc., which have given rise to some industry comments that what the CIA wants is a user group for users of its members' products primarily.

And yet, with all this, the availability of \$50,000 seed money must be regarded as being potentially one of the great events of the year. So, here are some suggestions as to how the offer could be converted into a realistic one.

No Special Interests

First of all, if the CIA really wants a "no-strings" operation, what is needed is not just computer users agreeing to a set of by-laws.

A lot of computer users, as can be noticed in various user groups, also have axes to grind. A Computer Users Association, such as the CIA suggests, could easily be run in such a way that some special interests of vendors, or other groups than just computer users, would be served. To prevent such a group from taking control, the by-laws would have to be carefully written, and the qualifications for membership would have to be for "independent" computer users, instead of just computer users.

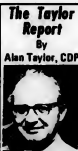
A good way to start, then, would be to create a set of effective by-laws that preserve the independence of computer users and the "no-strings" organizations involved. This could then be reviewed by the CIA attorneys, found to be acceptable or modified, and then published, so that computer users would be able to see from the outset what it was they were

interested in. If later they wanted to make changes, then the changes could be reviewed by both the CIA, as providers of seed money, and by the potential members.

Secondarily, there needs to be some test to find out whether the CIA suggested

organization is really needed at this time. True, the CIA may think it is needed — and perhaps its existence will be very helpful from the point of view of the CIA — but that is no proof that it really is needed; nor is the fact that a few installa-

(Continued on Page 12)



Are You For an Independent User Group?

- (1) Are you for or against it?
For () Against ()
Why? _____
- (2) Do you know anyone who would give \$50,000 with no strings attached?
Yes () No ()
- (3) Should the group wait for such support to be found?
Yes () No ()
Why? _____
- (4) Would you be interested in joining such a group?
Yes () No ()
Why? _____
- (5) What would you want from it and what would you expect to pay for it?

Name _____ Title _____
Address _____

Solving Social Problems by Computer—Part IV

DPeres Must Refuse Jobs Which Deny Essential Rights

The following is the concluding part of a series based on a speech given at the New York Academy of Sciences Oct. 9, 1972.

By Daniel D. McCracken

Special to Computerworld

The potential implications of computer applications in the social sciences are manifold, and there are certain considerations which should be made in the planning stages.

• Who benefits and who pays? We have seen altogether too many situations where the middle and upper classes benefit while the poor people pay; think again of those highways that bulldoze through the only housing available to poor people in our cities, so that suburbanites get to and from work a bit faster and with less necessity to have their sensibilities bruised by looking at slum housing. Does this apply to computing?

• We have known at least since Bacon

that knowledge is power. Does the new project you are planning place more power in the hands of people who already have most of it?

Take the case of computer analysis of prospective jurors. The client with lots of money and a big law firm can get a

Viewpoint

rundown on each of possibly 200 prospective jurors, adding greatly to his chances of getting a favorable jury. Is this justice?

Many writers have observed that a society should be judged on how it treats its least fortunate members; does your new project work in that direction or in the exact opposite?

• When dealing with people and their problems, don't assume that everything

important is quantifiable, or that just because somebody has attached a number to some trait it means anything. Recent studies have indicated, for one random example, that psychiatrists cannot reliably diagnose schizophrenia, which is merely the most common cause of admission to mental hospitals.

If you are presented with a sheaf of papers containing classifications of mental health and asked to do a regression analysis or something, pause to reflect that running meaningless data through a computer does nothing but turn out meaningless results.

• One of the toughest problems we face in an information-rich era is to find a good balance between the individual's right to privacy and the society's right to knowledge. If a good study of the correlation between two diseases would lead to better lives for thousands, does the individual have a valid right to refuse to

give the needed data?

This is clearly a problem that has only proximate answers, which have to be worked out anew for every new application. We seem at this time to be moving in both directions at once: asserting the individual's right to privacy while at the same time pressing for more studies involving vast amounts of data.

• Finally, does your new project have an impact on the way people think about themselves? Does it tend to reduce them—in their minds if not yours—to holes punched in cards? If so, are the potential gains worth it? Will your project contribute to the pernicious growth of the notion that—except for credit card billing—computers are "oolproof" (not solvable by computer, and to try to do so is in fact worse than useless: it delays finding good solutions or it worsens the problems rather than helping them).

I believe that a new era of humility is called for. We in the computer business need to be more aware of the serious consequences of our mistakes. We need to slow down. We need to take on about half as much work, but do it more than twice as well.

We need to do the unthinkable—L., tell the boss now and then that a given job ought not to be done, because it cannot be done safely or in a way that protects peoples' essential human rights. Unthinkable, indeed. Almost never done. But it should be.

Daniel McCracken is the author of a dozen textbooks on computer programming and an observer of the social problems associated with computer technology.

More Work Needed
On CIA User Offer

(Continued on Page 11)

tions might be prepared to come forward and take leadership roles.

In the original CIA concept, \$150,000 was to be used to set up an organization of still unproved value. Instead I suggest a lesser amount would be needed to set up a test, so that if the organization is needed, then it will itself be able to attract its operating funds after the seed money is provided.

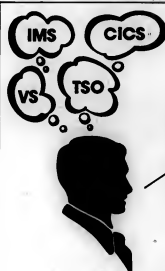
As to how much money this is, I think that we could use the example of the CIA itself. It was set up by some energetic leadership that believed in the CIA concept and \$50,000. If such an organization, after such a short period of existence, is now able to offer \$50,000 seed money to a "no strings" operation, then it must clearly be a success.

Really then, what I am suggesting is that the CIA spend its \$50,000 to finance a good executive director ready to dash around the country, getting members and doing things. If at the time the money runs out, he has not been able to raise in grants, or dues, etc., enough to keep his organization going, then it should close down. I think this would achieve the CIA's aim.

This is where you, the reader, comes in, because you can give the CIA your opinion and the possibilities of your support for such a new organization.

To help you, here is a form which will allow both the CIA to have your opinion, and allow a later Taylor Report to tell everyone your reasons for supporting or opposing the concept of a "no strings" computer group.

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SOFTWARE & SERVICES

Random Notes

Interface Allows New Sorts To Handle 1400-Type Files

LYONS, Ill.—Installations working with 1401 compatibility mode on the 360 or with the 1401 emulator on the 370 can use IBM's current sorts on 1400 Series data files with the Sort Interface from General Electronics. The interface works with either IBM's 483 or SMI sorts, the company noted.

Separate versions of the interface support different user configurations. Version 1 is for 360s with 231 or 2314 disks, while version 2 is for 370s and 3330 disks using the 5741-SMI sort. The interface adds 12K to the requirements of the sort being used. The interface costs \$350 (version 1) or \$450 (version 2) and can be ordered from P.O. Box 79, 60534.

'Sprint' Spooler Updated; Now Has Procedure Library

EL TORO, Calif.—A procedure library system is now available as part of release 6.2 of the Sprint utility package from Jason Data Services.

The procedure library support allows users to maintain job control streams, programs and data files on disk and to retrieve each with a single job control card. The new facility is available free to current Sprint users. The package itself costs \$50/mo. Jason said from 22511 Woodcrest Circle, 92630.

'Easytrieve' Made More Flexible

OAK BROOK, Ill.—More flexibility in report formatting, support for mixed disk devices and improved accessing techniques in connection with Isam files are among the features added to version 4 of Easytrieve, according to the vendor, Panophic Systems, Inc.

The retrieval package has additional accumulator fields. In the new version, sort support has been extended. When a sort command is used, Easytrieve first passes the number of records to be sorted.

Panophic is at 1301 W. 22nd St., 60521.

PHI 'Payroll II' Goes on H6000s

TEWKSBURY, Mass.—The PHI Payroll II system has been adapted to run on even numbered models of the Honeywell 6000 series mainframes under the GCOS operating system, according to the PHI vendor, Wang Computer Services. When used on the 6040, 6060 or 6080 CPUs, it requires approximately 50K words of internal storage.

Written in IBM Cobl for operation on large machines, PHI Payroll II is described by Wang as extremely comprehensive. It includes a personnel subsystem and a tax module for all federal and state taxes and certain local taxes as well.

Wang is at 836 North St., 01876.

Conference Study Groups Find

MIS Planning Can't Replace Leadership

By Don Leavitt
Of the CW Staff

LOS ANGELES—There is a growing need for more formal MIS planning in systems planning, but good formal planning cannot replace the political sensitivity, entrepreneurship, conceptual contribution and basic business acumen required of the successful MIS executive.

That near-paradox was among the conclusions reached by working groups at an invitational conference sponsored here recently by UCLA and McKinsey & Company, Inc., and chaired by Dr. John V. Soden of McKinsey and Dr. Ephraim R. McLean of UCLA.

Success in planning for information systems hinges on three factors, according to a survey reported by Soden. Previous credibility of the MIS group in managing development projects and computer operations is of vital importance, he said.

The maturity of the overall organization's management processes, as reflected in the methods it uses for conducting general business planning and making capital allocation decisions, also affect MIS planning. And, Soden noted, the choice of MIS planning approach is also a factor in the final success or failure of the project.

The work groups found the need for

formal long-range MIS planning is growing as the systems being considered become more complex, require longer to develop, involve multiple operational functions or departments and cost more money.

The benefits that can accrue from long-range planning—improved short-term decision-making, enhanced communications between affected departments and a firmer commitment of resources—generally outweigh risks of the undertaking, the conferees found.

Though the general need for planning is recognized, proven formal planning approaches range from the "controlled reaction" tactics of formally evaluating and ranking projects, to the strategic top-down scanning of the overall organization to locate high-leverage planning and control system application opportunities.

Delicate Balance

Another working group found the selection of a particular planning approach requires a careful balancing of factors. These include the position of the DP function and the role of the MIS organization, the degree of maturity in those areas and the sophistication of the executives in the general corporate structure and in the individual "user" departments.

Nucleus Supports Integration of Accounting Program Modules

MARINA DEL REY, Calif.—IBM 360/370 users can acquire a master control system (MCS) from International Management Systems Corp. (IMS) and use it as the basis for an integrated accounting system based on application modules from IMS, user-written programs or a combination of the two.

The MCS is a table-driven operation that lets users add, delete, insert, update, edit, validates and formats transactions for each of the application modules. It has the ability to explode a single entry into separate transactions for each application affected, including general ledger.

Although this nucleus can be integrated with the user's existing application programs, IMS has a library of modules that can be more efficient since they were designed specifically to work with the MCS. A generalized report writer module is also available for users who want more retrieval flexibility than is provided in the prepackaged reports.

The IMS general ledger module is itself made up of several submodules so the user can shape the system more precisely to his needs. The submodules currently available include fixed assets accounting, cost allocation, budget and "manufacturing," primarily for labor expense control.

The accounts payable module includes purchase order and check reconciliation

submodules, while the accounts receivable module can be extended to include sales analysis, IMS noted.

The payroll module has personnel and labor subsystems that can be used with it. In addition, there is a project control application that is "somewhat unrelated to accounting but can be integrated into the system anyway," an IMS spokesman said.

This module has the capability of keeping track of all jobs or projects in process, "as well as revising estimates, looking at target dates and that sort of thing."

The MCS is the largest part of the IMS system and it will run in 55K on a 360/370 with two disks under either DOS or OS.

MCS can be acquired for \$1,000 if used only with IBM's applications, for \$4,000 if used with IMS and user programs, or for \$7,500 if it is to be used only with user applications.

The major application modules range from \$10,500 for accounts payable, up to \$15,000 for payroll. The report writer module is \$1,250.

The submodules also vary in price from \$2,000 for check reconciliation to \$4,000 for fixed asset accounting.

IMS is at 4676 Admiralty Way, Suite 217, 90291.

Generally speaking, MIS executives most advanced in planning have become an integral part of the general management team of their organizations, the conference participants agreed. When that happens, they added, MIS strategies "have a major impact on, and corresponding interrelation with, the long-range business plan of other functional executives."

That interrelationship is the key to the conclusion that all the attributes of basic business leadership finally are more important to the successful MIS executive than all the formalities of good planning, even though these have to be among the tools used to reach that success.

'CUE' Enhancements Measure VSI Usages

SUNNYVALE, Calif.—OS/VSI users can evaluate system performance directly rather than through interpretation of SMF Data with facilities recently added to Configuration Utilization Evaluator (CUE) software monitor from Boole & Babbage, Inc.

The V5-oriented modifications result in creation of two new utilization reports covering main storage, and real storage and page use.

The VSI/ Main Storage Utilization Report provides management with an overview showing memory characteristics, memory usage and paging characteristics. It also reports the time partitions are occupied by excessive paging activity, the percentage of time running as Virtual-Real, and the average time required to service a paging I/O request.

The VSI Real Storage Page Utilization Report provides system programmers and measurement analysts with more detailed information. Paging activity and real storage usage are shown in terms of paging threshold parameters, real storage use in the fixed nucleus, pageable supervisor, partition space and available page space.

The percentage of time paging I/O is in process is also shown, a Boole & Babbage spokesman added.

Working with CUE's data gathering techniques rather than those of IBM's SMF, the updated package probably avoids wasting the time and space otherwise devoted to data that is of little value to the VSI environment, an observer noted.

The VSI measurement facilities are included in the basic OS-oriented CUE package. Added changes to monitor VSI support can be ordered for \$8,800 from IBM but little work is now being done on DOS/VSI measurement at B&B, the firm indicated.

OS-based CUE, with or without the VSI support, can be ordered for \$8,800 from IBM at 850 Stewart Drive, 94086.

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Says IBM Hasn't

Independent Ties Cobol, Vsam

PHOENIX — Cobol programmers working in VS environments on 370 gear can manipulate key-sequenced Vsam data sets in native mode with the RVsam system from GSI Corp.

Although IBM has promised Vsam support for its Cobol compilers for some time, the mainframe has yet to actually make the coding available, a GSI source said. RVsam provides the user a set of CALLs that permit full utilization of Vsam, without the restrictions and overheads required by the Isam interface — the usual route to Vsam until IBM provides the direct path.

The system allows retrievals, updates — including modification of record length, insertion and deletion of records in sequential, skip sequential or direct access mode. RVsam also permits any mixture of sequential and direct accesses after the issuance of only one OPEN, GSI said.

The independent's access method coding also allows the application program to skip forward or backward in the Vsam file on the basis of either a full key or just the generic or leading portion of the key.

In other words, GSI suggested, RVsam permits programs written in Cobol, or any language adhering to Cobol linkage conventions, to take full advantage of key-sequenced data sets immediately. System designers can devote themselves to record handling logic as required by the application, not as dictated by the older access methods.

RVsam itself is written in the VS Assembler code available to both DOS/VSAM and OS/VSAM shops. It requires about 4K bytes when called into a user's program, and is available now for \$2,500.

GSI can be reached through P.O. Box 16201, 85011.

'Datafilter' Eases Development Tests

MANCHESTER, England — Sharp reductions in the cost of producing and testing data validation programs on IBM 360/370 or Univac 9400 or 1100 series CPUs are possible with the Datafilter system, according to the developer, Hulme House Ltd.

Without requiring detailed coding, the system handles a wide variety of data types and complex levels of checking, so almost all validation criteria can be covered by standard facilities. Suitable for any I/O medium, it will accept data in any format and code, the firm said.

In addition to validations on individual fields, Datafilter also carries out cross-field checks and references to external files, and accumulates batch totaling and reconciliations. User routines can be written in Assembler, Cobol or PL/I and linked to almost any point of the validation process, a spokesman added.

The package contains control and test modules, together with facilities for transferring punched paper and punched cards files to mag tape or disk, and mag tape edit facilities.

The test modules allow data from user departments to be tried very early in program development. Weaknesses in the data structures or the collection system can thus be seen — and hopefully corrected — before such major revisions become difficult.

In operation, all I/O messages are put out on the line printer. Normal commands for other peripherals are intercepted and unexecuted, thus eliminating device handling from the testing stage.

Datafilter can be used under either OS or DOS/360-370 or the Univac operating systems. It is currently available in the UK and the firm indicated it will welcome inquiries from potential U.S. agents.

Hulme House is at 223 Corn Exchange, Hanging Ditch, Manchester M4 3BP.

MRI Backs Interface Linking CICS, S2000

AUSTIN, Texas — MRI Systems Corp. has developed an interface that enables users of IBM's CICS teleprocessing monitor to communicate directly with MRI's System 2000 data management system.

The interface provides access to System 2000 data bases through user-written message processing programs in conventional high-level languages or in System 2000's English-like natural language.

On-line users of System 2000 can share data bases concurrently with batch programs. The user language interface supplied by MRI supports teletypewriters and IBM 2740, 2741 and 3270 terminals. Terminal display, paging, input editing and other features are provided.

The interface is available from MRI for \$4,000 plus installation and maintenance. System 2000 data management system itself costs \$22,000 and is currently operational on IBM, Univac and CDC equipment.

MRI's mailing address is P.O. Box 9968, 78766.

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study with communications techniques at M.I.T., taught graduate-level computer systems design, and has served as professional consultant to such firms as IBM, Raytheon, ICC and MCI. Dr. Doll is in charge of our faculty of experts, and takes an active part in the entire seminar.

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COMMUNICATIONS

AT&T DI Costs Extra on Non-Bell Modems

NEW YORK—The new high performance data conditioning (DI) introduced by Bell for use with the 209 data set means an extra \$100 charge for users with non-carrier modems.

According to the tariff which took effect on March 25, 1974, the user must pay "a charge equal to the installation charge" for each service terminal ordered "subsequent to the start of the basic service. The installation charge is \$150 with a monthly rate of \$13.50.

The extra charge would be required as follows: If a user had a non-Bell data set and wanted to add DI conditioning, he would have to pay the standard \$150 installation fee in addition to the \$50 charge for each of the two service terminals. If, instead, the total charge to add DI to a non-Bell data set would be \$250, according to a Bell spokesman.

This contrasts with an installation fee of \$200 for each 209 plus \$150 for DI, for a user who installs a Bell 209 data set. Bell will not provide the 209 data set without the DI conditioning, so the total would be \$550.

In both cases, it is assumed the user

already has a Type 3002 voice-grade private line. Apparently, Bell will add a 209 together with DI without charging separately for the service terminal, but the addition of DI to a non-Bell data set will cost the user an extra \$100.

The DI conditioning was originally introduced for use with the 209 data sets which operates at 9,600 bps/sec. It is a new type of conditioning which provides the following technical parameters on Type 3002 voice-grade point-to-point lines at the request of the customer:

Signal to C-Notched Noise Ratio — 28 db

Non-Linear Distortion: signal to second order distortion — 35 db

signal to third order distortion — 40 db

The DI conditioning is not a substitute for existing C2 conditioning on Type 3002 private lines, a Bell spokesman said, and it is provided only for data transmission. It is not compatible with switched lines and a channel with DI conditioning may not "be suitable for voice transmission."

PABX Interface RCA Motel Mini Controls Terminals, Room Phones

By Ronald A. Frank

OF THE CW STAFF

PALM BEACH, Fla.—RCA has installed its first electronic hotel/motel property management system to automate the operation of a motel and add minicomputer control to a room telephone PABX system.

Called Dataway, the system includes an RCA 400 series minicomputer with semiconductor memory that can have a storage capacity ranging from 16K to 24K bytes.

The system is interfaced with the PABX in motels ranging in size up to 500 rooms and automates such functions as check-in and check-out, room status information, room housekeeping and automatically dialed wake-up calls to guest rooms. All functions are performed under control of the mini.

Provided on Turnkey Basis

The Dataway equipment includes CRT displays, journal printer, minicomputer

and the required interfacing to a PABX. It is provided to the user on a turnkey basis with all software and is designed to allow unskilled operators to use the system.

No on-site programming is required and all software is supplied on cassette tapes, including data unique to the motel/hotel such as room numbers, types, etc.

Current information is maintained by the mini on room and housekeeping status, and, through the PABX interface, local call restrictions, automatic wake-up calls and other functions with rooms, via telephone.

Housekeeping status information can be entered by a maid when a room is ready for occupancy. By dialing a special access code on the room telephone, the room data base can be updated to add the availability of the guest quarters just cleaned.

In addition to a CRT terminal at the front desk, typical equipment for CRT access would include the housekeeper, telephone switchboard and cashier.

Lists Available Rooms

At check-in, the clerk can call up on the CRT a listing of available rooms. The guest data is then added from the keyboard including the room number, length of stay and number of persons occupying the room. This data is then stored in the data base and the outside telephone system in the room is then automatically turned on.

At the switchboard, a CRT can be used to establish wake-up calls and messages waiting for individual rooms. Wake-up calls can be entered into the terminals and initiated by the mini through automatic call equipment at the proper time.

A record is made of whether the guest answered the call, and in the event the call is not completed, an automatic retry is attempted. A hard copy of all wake-up call records can be printed out.

The CRTs include special data entry and confirm keys and allow operators to check all information entered from the keyboard. The journal printer provides a 21-column printout of vital "property transactions" for a permanent record to management.

The Dataway system can record charges for authorized long distance calls and can divert long distance calls to the proper telephone operator. When a guest checks out, phone charges are totaled and the phone is restricted to in-house use.

A typical Dataway system including mini, cassette storage, dual CRTs and printer, together with required software to handle between 125 and 150 rooms, would cost about \$20,000 to \$25,000, a spokesman said.

The Dataway system is produced by RCA at 3900 RCA Blvd., 33403.

Multimini Front End Expedites Stock Transactions

By Patrick Ward

OF THE CW STAFF

CHICAGO—Reliability is a key advantage of the "minicomputer array" type of front-end processor, according to Patrick E. Ryan, vice-president of the Midwest Stock Exchange, Inc., who said this new installation achieves 99.8% uptime from this type of front end.

Ryan described his installation's front-end system as a 384K IBM 360/50 at a recent data communications seminar here.

The stock exchange's front end, furnished as a bundled package by Computer Communications, Inc., includes five mini processors with 16K of their own core and 16K of dual port shared core.

Four processors and their shared core form a square around the fifth mini CPU and its backup set of four memory units. A console operators can thus switch the central CPU to cover for any of the other four when a monitor prints out trouble signals, Ryan noted.

The advantage is "if you have a failure, you have a much smaller piece failing," and therefore the amount of recovery effort is less, Ryan stated.

A key reason for choosing this system over the IBM 2703 line controller was that if the 360 goes down, the front-end system can still provide interim service to customers.

The stock exchange has a second 384K 360/50 that can backup the other mainframe.

The stock exchange's system handles 250 terminals in brokers' offices, with 22

leased lines used in half-duplex mode carrying asynchronous transmission at 1,800 bps/sec to the front end.

Ordinarily this application system provides hard copy for the appropriate broker on the floor who then goes out and either buys or sells according to the order.

After taking the action, the broker on the floor fills in an "execution report." This message is entered into the system and comes back to the front end. The 360 then takes the execution report and matches it with the order. At the end of the day the stock exchange prints reports for individual brokers, Ryan said.

User Casebook

The front end's mini communicate in a counter-clockwise fashion to process data. The cycle starts with CPU A, which handles the lines and assembles data into eight-byte couplers, and passes this data to CPU B, which assembles the couplers into messages or segments, whichever comes first.

B also does header and validation tasks, Ryan said, and it then writes messages on- to a disk, and passes the disk address on to CPU C.

C takes the disk addresses, reads the disk and if the messages are to go to the mainframe, it passes them to it and awaits replies.

C then writes the 360's replies on disk and passes those addresses to D, which

reads the disk and passes data back on core couplers to A, which puts it back on the line.

A system of this kind requires a standard way for the minis to speak to one another, Ryan observed. With that standard interface, "it's possible to program the mini which handles the lines without knowing or caring what the other application's portions in the other (mini) CPUs are doing," he mentioned.

And this makes it easier to obtain programs, Ryan noted.

The Midwest Stock Exchange's front end runs from 6 a.m. to 8 p.m. or 9 p.m. five days a week and handles one or two transactions per second, which are generally under 200 characters, Ryan said.

The stock exchange bought the \$600,000 system about two years ago from CCI. A three-month installation followed.

"One of our most serious errors was not writing a definitive specification of what we wanted," Ryan recalled. "Any time put in this is wasted the effort," he advised.

The front-end system came to us "not well documented," he said, so the installation's entire 14-member programming staff at one time or another was involved in documentation of certain modules.

The stock exchange has a hardware maintenance contract with CCI but does its own in-house software maintenance. Computer Communications has been financially troubled and in Chapter 11, but is now out of it and is continuing to supply service, Ryan mentioned.

The ADAC 1200 is a natural outgrowth of our experience in design, mass production and delivery of acoustic couplers for the 0-300 bps market. It was the first 1200 bit acoustic coupler. It's now field proven in hundreds of installations across the country.

Garard W. Schenckel, Director of Marketing

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AT&T Restructuring Links Service to Account Type

By Ronald A. Frank
Of the CW Staff

NEW ORLEANS — AT&T is restructuring its selling and service organizations in a move apparently geared at giving increased attention to larger customers.

Three new groups of customer classifications will be established, according to F.A. McDermott Jr., director of sales development, who took part in an AT&T presentation at the recent International Communications Conference here.

The reason for the classifications was to match the qualifications of Bell System people to the customer's characteristics, McDermott said, and three types of accounts are included.

The national account is the classification given to customers who are "truly national in scope with major locations [served by] several operating companies." These customers have centralized communications control, substantial billing and large potential growth, he said.

The second classification includes selected and major accounts which require

that "the account representatives have specialized knowledge and/or training in order to be effective." This specialized knowledge may include operating characteristics of certain industry groups or it may include knowledge about the complexity of the user's communications needs.

These are typically large customers, major accounts that require the "attention of a full-time account manager and an assigned interdepartmental team." This type of customer is typically operating within the area served by one Bell company, McDermott said.

The balance of Bell customers will be classified as general business accounts, McDermott said, without further describing this category. He added that ICA members were generally included in the first two classifications. Members of ICA must have a minimum phone bill of \$1 million/year to qualify for membership in the user group.

Speaking about user problems relating

to competition between Bell and the specialized carriers, W.J. Schindele, AT&T assistant vice-president, said it was possible for the user to get caught between the telephone company on the one hand and the specialized carrier on the other when problems arise. Inevitably "one party waits for the other to act in clearing a case of trouble that each feels is the

other's responsibility," Schindele said.

In such cases the service is not working to the customer's satisfaction on an end-to-end basis, and no one is responsible for the complete service, he said. This contrasts with the relationship Bell companies have with independent phone companies, which work together in a spirit of cooperation, he said.

TI Adds RO Silent 700 Models

HOUSTON — The Digital Systems Division of Texas Instruments (TI) has added four receive-only models to its line of Silent 700 data terminals.

The models include two receive-only terminals, models 754 RO and 755 RO, which TI said feature a compact, space-saving design, and two receive-only electronic printers, models 752 and 753, for original equipment manufacturers.

Features available to users in these terminals include Ascii or Baudot/CITT codes and three different line inter-

faces — EIA RS 232C as a standard, or an optional do-current loop or bit parallel interface. Other features include switch-selectable printing rates of 10-, 15- or 30 char./sec and single- or double-line spacing. A paper out indicator is offered as an option for all four models, and the power supply is optional on the models 752 and 753.

Purchase prices for the models 754 RO and 755 RO, depending on line interface selected, range from \$1,450 to \$1,575 with lease rates from \$55- to \$100/mo including maintenance. Purchase prices for the models 752 and 753, without power supply, range from \$1,175 to \$1,300; price for the optional power supply is \$250.

In conjunction with the announcement of the receive-only units, the Model 720/730 series of terminals will go out of production effective December 31, 1974. These models, however, will be available after these dates for purchase or lease as used equipment on an "as available" basis, and the company will continue full spares and service support.

In addition to the receive-only terminals, the company announced an integral acoustic coupler option for its ASR and KSR terminals, and a binary data format option for the Model 733 ASR terminal. The solid-state acoustic coupler is mounted integrally in ASR and KSR data terminals. Purchase price for the acoustic coupler is \$395 with a lease rate of \$22.50/mo.

The binary data format option provides use of the eighth bit for information instead of parity in recording data on cassettes. With this feature, the Model 733 ASR can now be used to store and load binary object programs in mini-computer applications. The binary data format option is available for purchase at \$250 and for lease at \$10/mo.

The company address is P.O. Box 1444, 77001.

Standards for Packet Nets A Point of Contention

CHICAGO — The desirability of implementing standards for interconnecting packet-switched nets became a point of contention at a recent panel discussion here.

The issue was whether to settle for "primitive" standards now, or go without a standard while letting experiments continue until a more sophisticated standard appeared.

Lack of any standards means "a higher cost to all concerned," said Dr. Ralph Alter, vice-president of Packet Communications, Inc.

"It is better to have an imperfect set of standards" than none at all, Alter contended. If standardization is delayed, the cost is important because it rises off the day when the user can benefit, he said.

But "it is really too early to build any standards at all," countered Vinton Cerf, professor of computer science at Stanford University. Once a standard is decided upon, it would inhibit further experimentation, Cerf said.

A chairman, David Tutelman, supervisor of data networks control techniques at Bell Labs, seemed to express the prevailing viewpoint when he urged adoption of a rudimentary standard now.

By implementing a standard, we can learn about its weaknesses and then bring in better standards later, Tutelman commented.



BIGGER AND BETTER

Fabri-Tek, the leader in memory technology, has acquired Data Recall. We're now the largest independent memory manufacturer in the world. Seven plants in four countries. An expanded line of add-on memories for IBM and UNIVAC systems. 360's, all models. 370, models 155 and 165. System/3, model 10-1, 1106 and 1108. Plus worldwide marketing capability through our own offices and affiliated agents.

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Here are just a few of the features we offer. 1) Expansion of the 360/65 to 4 Mb from any amount of IBM core level... including relocate features in 256 Kb increments, with or without LCS. 2) An accelerated storage adapter (ASA) on the 370/155 that upgrades performance to 370/158 level. 3) Expansion of the 370/155 to 4 Mb. 4) 370/165 memory within the IBM limits. 5) Expansion of the 360/44 to 1 Mb.

FIRST WITH THE FINEST

Look at a few Fabri-Tek/Data Recall "firsts." First to add independent memory to the 360/22 and 30. First with console or desk high cabinet for the 360/22 and 30. First with independent memory for the 1108. First to offer 360/65 memory over 1 Mb that provides floating addressing for all system memories. First and only independent to offer add-on memory to the 360/25. And on and on.

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Our tradition of innovation is impressive, but we're not resting on past accomplishments. What we've done is just one indication of the technological advances you can expect from us in the future. So when you need more memory, go with the leader. Fabri-Tek/Data Recall — the logical choice.

Fabri-Tek/Data Recall memory extensions and service are available from these companies: Computer Investors Group, worldwide; Control Data Corporation, worldwide; CTRQ, Spain; FTI U.K., Eastern Europe; Orient Research, Far East; and directly from Fabri-Tek/Data Recall.



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Here's how it works

Simply enter any number in base 8, 10, or 16. Then at the touch of a key, that number is converted to either of the other two bases. And when you need to add, subtract, multiply or divide, the SR-22 does the job—again in all three number bases.

An algebraic keyboard means easy data entry. Numbers are keyed in the same order you'd write them on paper. The SR-22 can handle numbers up to 10 digits, then automatically converts to scientific notation. And the SR-22's big, bright display clearly shows you 10-digit mantissa and 2-digit exponent (alphanumeric characters 0-9, A-F), signs, floating decimal.

The SR-22 lets you operate in either automatic or manual mode conversions. In the automatic mode, pressing the desired base key converts both the calculator display number and operation to the selected base. In the manual mode, you simply enter numbers in one base and then press one of the other two base keys. The calculator converts the entered number to the selected base and is ready for your next entry.

Versatile 3-base memory

You can store, recall and sum numbers with the SR-22's memory. Memory keys operate on the memory and display only, without affecting previous instructions. And all internal operations and data are converted to the selected number base upon recall. For example, when you enter a base 16 number and later recall it in base 10, the number is converted to display in base 10.



The SR-22 weighs less than two pounds. Measures only 6 1/4 x 8 1/4 x 2 3/4 inches. From your desk it will operate on standard household current or 230V/50Hz common to Europe and South America. And if portable operation is required, you have the option of ordering a rechargeable Battery Pack.

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Send for an evaluation unit now. You may find that one SR-22 is all you need. Or, you may want to consider a quantity purchase to multiply the productivity of all your computer programmers.

Either way, you have nothing to lose in evaluating an SR-22 for yourself now. Then, if you don't find it fully justifies every dollar

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Texas Instruments Incorporated
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3-base calculations. 3-base conversions. The SR-22 hexadecimal calculator/converter does away with conversion tables. Replaces mechanical calculators. Ends tedious longhand methods. TI designed it for you. All for only \$249.50



Accessory options give you total portability.

A charger-adaptor (AC9222) is included in the SR-22's price.

In addition, a nickel-cadmium battery pack (optional for the SR-22) gives about four hours of continuous operation before recharging. It may be charged while the SR-22 is in use.

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Use the SR-22 for 15 days at no risk.

Mail this order form along with a check, money order, or company purchase order only for each unit(s) ordered. Use your SR-22 for 15 days, then if you're dissatisfied in any way, return it in the original carton along with all accessories for a full refund. Please add state and local taxes where applicable.

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Memorex Disk Controller String Switches 8 Drives

SANTA CLARA, Calif. — With the Memorex 3672 disk controller, users of IBM 3330- and 3330-11-type Memorex replacement drives can string switch two strings of up to eight disk drives each between two CPUs.

The 3672 is used in conjunction with Memorex's recently announced 3673 disk controller for single-density 3670 and/or double-density 3675 disk drives.

The 3672 is connected in front of two regular Memorex 3673 disk controllers or one 3673 and an IBM Integrated File Adapter. The 3672 is priced at \$11,650/mo on a one-year lease from the firm at San Tomas at Central Expressway, 95052.

Prime Uses 4K MOS Chips For 32K Memory Board

NATICK, Mass. — Using 4K semiconductor memory chips, Primc Computer, Inc. has packed 32K 16-bit words of memory on a 16 in. by 18 in. board for its series of minicomputers.

In addition, the firm has released a diskette drive which can format floppy disks for the user's requirements.

The 32K boards will enable users to build computer systems with up to 256K words of main memory in a chassis 16 in. high. The 32K boards, when purchased as add-on memory for systems already installed, cost \$11,000.

The diskette can provide a maximum storage capacity of 3M bits. It has 77 tracks, a transfer rate of 250 kbit/sec, 10 msec track-to-track access time and a 10 msec bad settling time. The diskette can be used with Prime's DOS and a dual diskette drive is priced at \$4,700.

Prime is at 17 Strathmore Road, 01760.
System/3 Ribbons Reinked to Save 50% to 70% in Supply Costs

DOVER, N.H. — IBM System/3 users can have their IBM 5203 printer ribbons reinked, reconditioned and reinked at \$6.25 apiece.

The service, available through Yankee Computer Supply, is said to save 50% to 70% in ribbon costs with an average of two reinkings on each ribbon. The firm is at 107 Silver St., 03820.

Floppy Disks Loaded 20 at a Time

ANAHEIM, Calif. — Every five seconds the GSI model 150 Autoload will pop a floppy disk into its IBM 3740-compatible diskette drive.

The unit automatically feeds up to 20 diskettes, reads and stacks them.

The 150 is priced at \$3,000 and interfaces for most minicomputers will be under \$100 extra from the firm at 1100-D St. Claudine Place, 92805.

OCR Alphabetic Handprint Added to Scan-Data Unit

By Vic Farmer
of the CW Staff

NORRISTOWN, Pa. — Users looking for a relatively inexpensive alphabetic handprint OCR reader can obtain Scan-Data's new alphabetic option for the firm's 2250 OCR reader. The character set includes 26 upper-case alphabetic characters and six symbols: plus, minus, asterisk, slash, greater than and less than.

The alphabetic set can be used in conjunction with a numeric handprint character set, but a company spokesman recommended keeping the individual fields either all alphabetic or all numeric for the best results. Mixed fields will have a much higher error rate and may even need 100% key verification, the spokesman said.

The 2250 does allow specification of field, and a street address application, for example, could consist of numeric field followed by an alphabetic field.

The Scan-Data handprint option can be field-upgraded through the replacement of the scanning circuitry.

The new recognition unit uses nine overlapping areas on each scanned character. Each area is examined for the presence or absence of 256 features specifically designed for the alphabetic handprint character set.

This coding scheme allows over 25⁹ possible combinations of codes to define characters and their variations.

Reanalysis Possible

These feature codes, "along with character height, width and data type information, identify the character being scanned," according to the firm. Individual characters can be reanalyzed as many times as the software specifies at up to 21 different shades of gray intensity.

OCR Scanner Handles Up to 3,000 Sheet/Hr

NEWTOWN, Pa. — A \$1,000/mo optical scanner from Optical Scanning Corp. handles documents ranging in size from 2 in. by 3-2/3 in. to 8-1/2 in. by 11 in. at a maximum rate of 3,000 sheet/hr.

No software is required to change the format from one form to another as the scanner is controlled through the use of program sheets.

The system, called the Opiscan 27, reads numeric OCR-A, numeric handprint and pencil marks. The system may be used in a free-standing configuration providing records on magnetic tape or it can be used on-line.

Output devices include mag tape, cassettes, printers, card punches and telecommunications adapters.

The company can be reached through P.O. Box 40, 18940.

levels

The terminals provide facilities for validation, correction and reject handling of scanned data.

The handprint option costs \$1,950/mo and a typical 2250/1 system will cost \$7,000 to \$9,000. The systems presently are limited to reading alpha and numeric handprint, upper and lower OCR-A, and OCR-B.

First User

The first customer for the alphabetic handprint feature is Migros, a cooperative of retail stores and food processors in Switzerland. Delivery is slated there for the end of the year with regular deliveries starting in the first quarter of 1975.

The equipment will read the recommended shapes for alphabetic handprinting being reviewed by the American National Standards Institute and will be modified to fit the standard when [and if] it is finalized, according to the firm.

Double-Density 3330 Vendors Active — Ampex Enters Market

REDWOOD CITY, Calif. — Ampex has joined the ranks of independent disk drive suppliers offering IBM 3330-type 200M byte/spindle disk drives.

The Ampex DM-331 has an average access time 2 msec faster than the IBM 3330-11 and occupies 50% less floor space, according to the firm.

Priced at \$20,000 each for the single-spindle drive, the firm has not yet announced a controller price.

The firm is, however, modifying its 3330-compatible DC830 controller and setting up a new microprogram for the floppy disk program loader in the DC830 that will allow intermixing of 100M- and 200M byte/spindle drives.

The DC830 controller presently is priced at \$50,000. Deliveries are slated for the fourth quarter of this year from

HP Mini System Dedicated to Basic

CUPERTINO, Calif. — Hewlett-Packard has packaged an HP 3000 mini system with new software to come up with a Basic-oriented time-sharing system.

The HP 3000/Model 100 accommodates up to 16 terminals each with access to all peripherals. Through Basic commands users can call up programs or subroutines which the system has batch compiled in Fortran, Cobol or SPL. These subroutines, depending on how often they are used, can speed up run times from 10 to 100 times, according to HP.

The system uses identical file systems both for time-share and batch, so all files can be made available to any user in any operating mode, HP said.

Price of the Model 100 is \$129,500 with deliveries beginning in July. Optimized for Basic, the system is less costly than other 3000 systems, HP noted. Terminals are additional, but the card reader and line printer are included. HP is at 11000 Wolfe Road.

the firm at 401 Broadway, 94063.

Calcomp Prices Out

Meanwhile, Calcomp has released prices on its previously announced IBM-compatible 3330-11-type drives. Purchase price for the Calcomp 1035 controller is \$4,900 and one-half-density, two-spindle drive is \$45,000. Monthly rental is \$1,650 for a controller, \$700 for the two-spindle drive on a one-year lease.

Among the features offered by the Calcomp system are dual access, which allows two independent data paths from two controllers to a shared string of up to 16 spindles; two-channel and four-channel switching; and format write release.

Calcomp is at 2411 W. La Palma Ave., Anaheim, Calif. 92801.

DEC Minis Get Line Printers

MAYNARD, Mass. — Digital Equipment Corp. (DEC) has announced a "new generation" of 132-column, 300 line/min printers for PDP-8, PDP-11 and PDP-15 minicomputers. The two new printers, models V and W, are priced up to 43% less than equivalent older models in the DEC line.

Deliveries in July

The Model V, with a 64-character set, is priced at \$9,900 or 43% less than its predecessor. The 96-character Model W,

which prints upper and lower case, sells for \$11,900 or 37% below the cost of its prior counterpart. Deliveries are scheduled to begin in July.

Both printers, manufactured for DEC by Data Products Corp., produce multiple copies with up to six parts and feature an 11-position manual selector to provide "top of form" positioning for forms three in. to 14 in. long. Using a continuously rotating character drum, the printers are switch-selectable for either 6- or 8-line in. and have a bar-wired self-test capability.

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SPEED	80 to 200 lpm
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Now all you need is money.

If you're willing to buy five Nova 2's at a time with 16K or 32K memory in each, you can get them in any quantity, within 60 days.

And for those who only want one, we've come up with five different Nova 2 systems you can buy one at a time.

The smallest is built around our RTOS operating system. Which makes it a great little real-time data acquisition satellite.

Next up the line is our SOS system. A small single-user computation system for people who don't need a disc.

Then there's the medium-sized RDOS system you can use to develop software and hardware interfaces, or to build your own medium-sized computation system.

Which is followed by a big RDOS system with more storage and faster output for higher throughput.

And finally, for the people who need a system with a built-in backup computer, there's the Dual Nova 2.

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CIS Channel Interface Connects Peripherals to IBM 360s/370s

LOGAN, Utah — Two 15-1/2 in. by 15-1/2 in. circuit boards provide interface electronics required to directly connect peripherals, terminals and data entry products to IBM 360 and 370 I/O channels.

The products, from Computer Information Systems (CIS), use a nonprogrammable control unit interface called Ibmint to support up to 256 IBM channel addresses at a maximum transfer rate of 1 Mbyte/sec. The units can be connected to the selector, multiplexer or block multi-

plexer channel of the 360/370.

An additional interface, Mibmint, allows the connection of a minicomputer to provide programmable capabilities for tasks such as multiplexing, front-end

OEM Products

processing, formatting, editing, code conversion and message switching. The units allow emulation of IBM peripherals providing both hardware and software compatibility, CIS said.

Optional features available with the interface units include automatic power sequencing, alternate channel control, automatic command rejection/acceptance and a control and display panel.

Ibmint is priced at \$4,400 and Mibmint costs \$4,900. Delivery is 60 days from the firm at 2084 N. 1200 East, 84521.



Card Reader in Control

Ninety-six-column cards have been used for price tags, to free up drawer space and to save paper. Now Decision Data, Hershamp, Pa., has installed its Model 9625 card reader to program and control a backplane wire wrapper.

The card reader provides the flexibility for making modifications and additions by removing individual cards representing each wire, and altering the origin, routing and termination instructions. New cards can be placed in the deck for additional instructions.

Microprocessor-Type Microdata 800/1600 Has 1K ROM, 1K RAM

IRVINE, Calif. — The microprogrammable Micro-One from Microdata Corp. is a microprocessor version of the Microdata 800/1600 series of computers.

Interface hardware is available to provide plug-to-plug compatibility with other Microdata computers and peripherals; the Micro-One can be microprogrammed to emulate other general- or special-purpose computers, according to the firm.

With 1K words of ROM and 1K bytes of RAM memory, it occupies one 8-1/2 in. by 11 in. board. The small size is achieved by utilizing ROMs for the control logic of the CPU, the firm noted.

The unit allows memory addressing to 65K bytes, compatibility with MCS or core memory modules, 1.2 usec full cycle memory and an 8-bit arithmetic/logic unit.

The Micro-One is priced at \$895 in quantities of 20 from the firm at 17481 Red Hill Avenue, 92705.

Calkamp Drives Use Five-High Disk Pack

ANAHEIM, Calif. — The Trident series of disk pack drives from Calkamp uses a five-high disk pack (three standard 336-type disks plus two cover disks) mounted on a 330-type spindle to give 25-, 50- and 80M-byte capacities. Five surfaces are for data and a sixth surface is for servo track positioning.

The series uses 370 track/in. technology with up to 815 cylinders and a 806 kbytes/sec data transfer rate.

Each drive includes an air flow system, power supply, control and data electronics, and a variable frequency oscillator which synchronizes the read/write timing to the pack. The unit provides a digital interface.

The T25 25M-byte drive is priced at \$4,430 and the T50, \$5,210; and the T80, \$6,130. The units are available from the firm at 2411 W. LaPalma Ave., 92801.

Pertec Floppy Disk Drive Offers Retractable Head

CHATSWORTH, Calif. — Pertec's FD400 floppy disk drive is compatible with data written on IBM 3540 or 3740 systems. It has a retractable head to increase head and media life.

When under program control, the head is unloaded from the diskette and physically removed from the media.

The unit is priced at \$650 without controller from the firm at 9600 Irontdale Ave., 91311.

SYCOR INTRODUCES THE SPEED READER.



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'Open Door to Enhanced Benefits'

Transportation System Standards Urged

By Edie Holmes
Circus crew staff

WASHINGTON, D.C. — "Adopting and implementing certain standards, even within a single transportation mode, can open the door to enhanced computing benefits," Joseph M. Henson, vice-president of IBM, said recently at a national forum on "interfacing transportation data systems."

Henson urged the sponsors of the meeting, members of the Transportation Data Coordinating Committee (TDCC), to complete work on standardized codes in order to open the way for development of more computer applications for the transportation industry.

The banking industry is one field which has standardized codes and enjoys increased savings resulting from a wider variety of computer applications, he said.

"That industry would have chaos today — rather than free-flowing data systems — if industry representatives had not arrived at a standard coding system, made it official in font and physical characteristics and realistically enforced and encouraged its use," he said.

"Of course, the computer industry could not have provided the specialized banking equipment and software without those standards," he added.

No industry uses computers more extensively than transportation, in Henson's view. But he contended that, "as an industry acting in concert to achieve sorely needed data exchange standards, we have miles to go."

The "stop-action" picture provided by machines that can reduce the time between what's happening, and the analysis of that happening, make computers essential to an industry that doesn't stop moving, he suggested.

Henson noted the overwhelming development of computer applications in the area of operations, citing examples of savings for a motor carrier, a rail line, an air traffic control system, a major steamship company and a freight forwarder.

But while "in-house computers speak eloquently to one another because companies have standardized all key data elements within their individual companies, their attempts to communicate across company lines produce only incomprehension," Henson said.

Progress toward increased communication between companies within an industry

try and between different industries depends on the standardization of codes along the lines proposed by the TDCC, he reiterated.

TDCC appears to have made some strides in establishing coding standards, he said. Six standard coding systems have been either accepted or are in some phase of acceptance by industry, he noted.

For example, automatic car identification labels have been accepted by the railroad industry, a standard maintenance status coding system has been adopted by the American Trucking Association and a shipping status reporting standard should become an effective method of data exchange between motor carriers.

Intramodal systems, such as those used by the banking industry, are like stepping stones to the higher and safer ground of intermodalism based on systems and standards established between industries, Henson commented. He noted the strides

made in intermodal standardization by the grocery industry with its various suppliers and services.

The transportation industry as a whole should be able to achieve this kind of communications, Henson said, but only "if we put aside diverse corporate procedures and opinions and work toward agreeing on and implementing standards under the TDCC umbrella."

"Imagine the impact on the world's freight hauling system, if, at the time a shipper prepared a commodity for shipping, he would affix a label on that commodity that indicated its commodity code, destination code, carrier code, patron code, tariff code and routing code. Virtually no other piece of paper would be needed except in summary form."

"Tariffs could be retrieved and calculated automatically. Shipper, carrier or consignee could trace the movement of freight at each stage," Henson said.



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HANSCOM FIELD, Mass. — Equipment to assure an uninterrupted flow of electricity to a select bank of Strategic Air Command (SAC) computers, despite possible commercial power failures, has been installed at Offutt Air Force Base, Neb.

The equipment was installed as part of a \$10 million program to overhaul and modernize portions of SAC's Automated Command and Control System. Computers in this system depend upon commercial electrical power, with three diesel generators as back-up should the power fail or be interrupted.

"A drawback has existed in that generators involve delay in starting," explained program manager Martin F. Anderson of the U.S. Air Force Electronic Systems Division's Deputy for Command and Management Systems. "This causes the computer systems to fail, requiring extensive efforts and valuable time to reload them and bring them back to their original status."

"Such a delay can be disastrous," Anderson added, "in an age when nuclear battles can be fought in minutes."

The new equipment was built and installed by Aviel Corp. of Covina, Calif.

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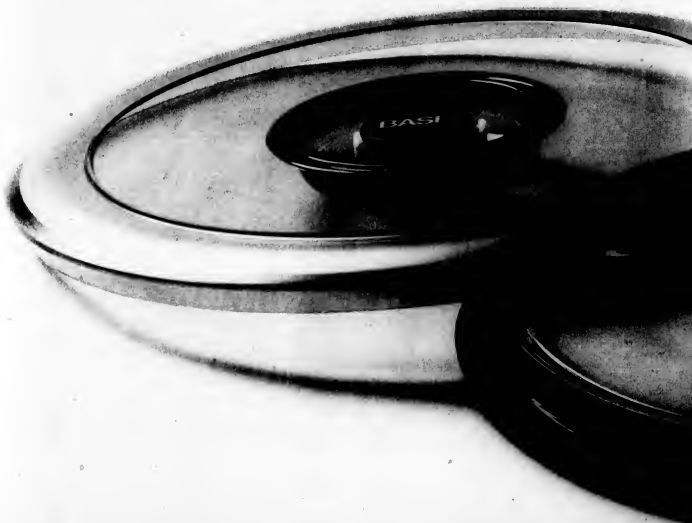
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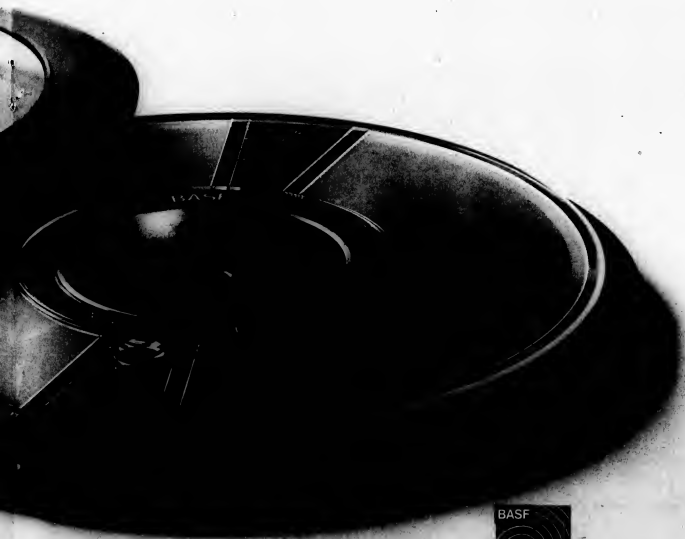
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Housewives' 'Underground' DP Service Breaks Down Recipe's Nutrition Count

By Nancy French
Of the CW Staff

CAMBRIDGE, Mass. — Two women who combat the housewife blash by running their own home-based computer service company now are offering computerized nutritive analyses of foods prepared from recipes.

For a small fee, Consultants will analyze the ingredients in each recipe and print out a breakdown of: calories, protein, carbohydrates, fats, sodium, Vitamin A, Vitamin C, Thiamin, Riboflavin, Niacin, calcium, iron and cholesterol.

The service grew out of three years of contract programming which Karen Brothers and Louise Silver have been doing for local clients in the area of statistical analysis, general ledger accounting, data reduction and simulation. The bulk of their work is done on their own PDP-8 minicomputer installed in Brothers' basement, away from the children and pets at play elsewhere in the house.

When appropriate, they buy time on larger time-sharing systems outside the Brothers' home.

A Practical Analogy

Silver explained that the two often talked about putting their computer to work on household tasks. "We began doing recipe analysis for our own personal use," she said.

Working from metric tables supplied by the U.S. Government, the women found they first had to convert the standard volume measurements — cups and teaspoons, for example, found in normal recipes — into densities, and then from densities into grams to be compatible with nutritional tables prepared in milliliters.

"With the bulk of the needed ingredients now in core storage, we merely type in the amounts called for, with any additional ingredients not used frequently enough for permanent storage, and the machine does the rest."



CW Photo by N. French

A typical workday finds Louise Silver and Karen Brothers in basement "computer center" entering numbers from nutrition tables into the PDP-8's memory.

Silver said:

"Without the computer it would take about three hours to analyze one recipe," Brothers remarked. "A typical recipe now takes us from 10 to 15 minutes," she said.

Tricky Diets

This type of information would be important to the person trying to determine how much protein a particular non-meat diet contains, or to the weight watcher who wants to know the calorie count.

It would also help the person on a low-salt diet by providing sodium content, plus presenting a good idea of the nutrition versus dollar value of the foods being used.

"This type of information is especially useful to someone like my father who is a heart patient and overweight," Brothers said. "It's fairly easy to find low-salt diets or low-calorie diets, but it's difficult to find a diet that is low-salt, low-cholesterol, low-calorie and also low in saturated fats," Brothers said.

Through analysis of recipes someone with a particular dietary requirement can be certain

of eating safe limits of "dangerous" foods.

Working Within Limits

Recipe analysis is a good job for the PDP-8 with 4K storage since it requires little core storage. "In general we are more geared to jobs with lots of numbers to be shovled around as opposed to payroll, for example, where a great deal of storage is required," Silver explained.

One successful payroll application involved a small company with many freelance employees.

"There is no withholding involved, but employees are paid at many different rates, depending upon each particular type of work. To compute these manually would be a mess," Silver said.

Both graduates of MIT, the women formed the company as a solution to the career versus family dilemma, allowing them to continue their work as computer programmers while maintaining the flexibility they need to care for small children.

Silver's background is principally in systems programming and Brothers' is in scientific applications and statistical analysis.

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Prototype Demonstrated

Adoption Bank Gives Hope to Homeless

WASHINGTON, D.C. - Attendees at the recent 4th North American Conference on Adoptable Children saw a small-scale demonstration of a new tracking and listing system for child adoption which, if employed nationwide or even regionwide, could match thousands of so-called "undesirable" children with eager adoptive parents.

Six hundred conference members from throughout the U.S. and Canada saw the experimental "adoption information system" designed by Informatics, Inc., which could match children and parents, thus easing the financial burden on institutions.

According to Janet Hutchins-

"... all children can be adopted within their own ethnic and religious groups ... if the caseworkers have the resources to do it."

son, president of a citizen/parent organization known as the Council on Adoptable Children, said one of the greatest problems in adoption is that children become "lost in institutions and foster homes." Children who are "visible" can be placed. She said she was "thrilled" by the Informatics system because "it will make the children so much more visible."

Lack of Resources

"It's my contention that all children can be adopted within their own ethnic and religious groups within a single region if the caseworkers have the resources to do it," she said.

"Right now, Virginia doesn't know what Maryland is doing, and visa versa. And within a state, the people in the adoption end don't know what the people handling foster care are doing. Even from county to county there is very little exchange of information," she said.

Current statistics indicate almost 750,000 youngsters are available for adoption in the U.S. alone, according to Robert Steel, an Informatics spokesman. Many normal and healthy youngsters are considered "undesirable" in the region where they live because of the overabundance of children of their ethnic background. Puerto Rican children in New York City is one example he cited.

Others who are handicapped could have homes "if their options could be broadened" - if a greater number of prospective parents could be considered.

In this slow system, time is against you, because "after the age of five, chances for adoption drop to one in 13," according to the Informatics spokesman.

Three Profiles

The proposed system would have a data bank containing three types of data: child profile, family profile and resources profile.

The child profile would contain information such as age, physical characteristics, handicaps (if any), race, sibling status, sex and previous placement.

The family profile would contain information about the family and their child adoption re-

quirements.

The resources profile would describe what treatment facilities and child care services are accessible in each geographical area should they be needed.

Caseworkers would simply key in data about their clients, be it child or family, using a CRT terminal and the computer would search its files, displaying its search results and when desired, print out the hard copy as well.

From there, routine administrative procedures would go into motion.

"The computerized system is not meant to speed up administrative procedures - it merely provides greater options in bringing people together," said Steel.

At the present time no pricing information has been established for this time-sharing system.

Although it met with an enthusiastic response from the conference, professionals attending the conference, funds from state and federal levels of government are not currently available to put such a system into use, according to Hutchinson.

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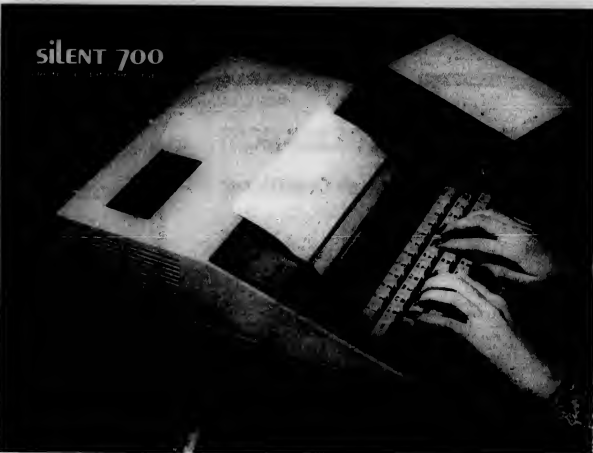
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Conflict of Interest Charge Costs City DPer \$10,000

By Patrick Ward
Of the CW staff

DENVER — A conflict of interest charge has cost Joseph M. Lewis, this city's DP administrator, five months off the job and over \$10,000 in lost pay. While Lewis has gotten his job back, it is not certain he will ever see the \$10,000 again.

The problem began when a local newspaper suggested Lewis had violated a city ordinance by going on speaking trips for Control Data Corp. from which the city annually leaves over \$150,000 worth of disk drives, add-on core and terminal equipment.

Denver's city charter forbids a city official from accepting money or other benefits from outside sources that might lead to a conflict of interest on the job.

After a hearing before an ethics board, Lewis was dismissed from his job. But a series of appeals followed and a career service board found that CDC paid Lewis for legitimate services rendered. The board said there was no evidence he tried to get preferential treatment for CDC or that CDC dealt with him to obtain it.

The board reversed the dismissal, but decided Lewis should not be paid for the five months between his dismissal and his reinstatement for being absent without permission.

Lewis and his lawyer have not decided whether he should appeal for his lost pay.

Four CDC Seminars

Lewis said he took part in four CDC seminars in various locations between 1970 and 1973. In three of those, he said, he received a \$100/day stipend beyond expenses.

The seminars were with CDC personnel, Lewis stated, and "we were discussing performance of their equipment, possible improvements to systems and things like that."

There was a total of about five days spent on the trips over four years, Lewis stated.

According to Richard A. Clark, city finance director and Lewis' direct superior or "appointing authority," Lewis neglected to inform his direct superior in writing about the trips.

The city requires that a non-elected official report in writing to his appointing authority any outside work before accepting it, and also that he tell the appointing authority if he feels he might be involved in a conflict of interest.

Violation of the rule can be grounds for discharge.

"Nobody ever told me they had to be in writing," Lewis recalled. Instead, Lewis said he mentioned his planned trips to Elmer Johnson, his superior at the time. But after the newspaper story came out, Johnson claimed he did not remember if Lewis had told him about the trips, Lewis noted.

Board Appearance

After the newspaper story appeared, Clark asked him for a list of trips and then asked Lewis and David Smith, DP department systems manager who had accompanied Lewis on at least one trip, to appear before the municipal ethics board.

The board found that Lewis' trips for CDC put him in a conflict of interest situation, but it was up to Clark to set the penalty, and he did so by firing Lewis from his \$2,170/mo job on Sept. 14. Smith was given a 30-day suspension without pay.

However, Lewis appealed for a career service officer to investigate the case.

The career service officer found that Lewis' CDC trips had not influenced his equipment selection, and recommended that Lewis be assessed a month's suspension.

Traveling Officials Closely Watched

NASHVILLE, Tenn. — Municipal DP chiefs who do a lot of traveling to conferences or user group meetings may find their local press tagging closely behind.

That happened to John Sorce, Nashville's assistant police chief and past president of the Univac Law Enforcement User's Group.

In a story entitled "Sorce Promotes Univac in Travel," a local newspaper noted the assistant police chief "has taken numerous trips to cities around the country" with costs shared between the city and Univac, "to share his experience and to promote Univac equipment."

In the story, Sorce was quoted as saying he had expected a call from a newspaper reporter, since he felt "widespread rumors" about the trips had distorted the facts about his relationship with the Univac user's organization.

According to the newspaper, Sorce said trips to several of the cities "involved telling potential clients of the virtues of Univac equipment," but the primary purpose was to share knowledge among fellow Univac users.

Promotion of Univac products stopped at telling potential users what

the Nashville police were doing with their equipment, Sorce noted in the newspaper story.

In a subsequent interview, Sorce told Computerworld he had not done any promotion work for Univac on the trips, and their entire purpose was to work out common problems and design mutually usable systems with other Univac users.

The user's group had met quarterly at user sites, with the members' municipalities paying the expenses, Sorce said.

At one time the group was meeting monthly and Univac did pay for the two extra meetings per quarter, he mentioned, but these payments did not include a stipend for group members.

For over a year now, the group has been back to quarterly meetings, all at user sites, Sorce emphasized. The only exception to this is when the law enforcement group meets at the same site as the Univac User's Association, so the smaller group's members can combine the meetings, Sorce noted.

In Sorce's case, no municipal board of ethics or legal action followed the original newspaper story.

and two weeks leave without pay.

Clark, however, refused to accept the recommendation, and Lewis took his appeal on to the next step, the career service board.

The board found that Lewis did not charge his absences against vacation leave, at least for most of the trips, and that

there wasn't evidence to show he had either oral or written permission to go.

But the board decided to reverse the conflict charge and the dismissal as of Feb. 13. Lewis' superiors had a 30-day period to accept the career board ruling or take the case to court. On March 11, Lewis was back on his job.

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The 1975 Caravan Schedule

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New York	Mar. 18 — 20
BREAK WEEK	Mar. 23 — 29
Cleveland	Mar. 31 — Apr. 2
Chicago	Apr. 8 — 10
Minneapolis/St. Paul	Apr. 15 — 17
BREAK WEEK	Apr. 20 — 26
Seattle	Apr. 29 — May 1
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(Optional NCC Add-On at Anaheim, May 19 — 22)

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COMPUTER INDUSTRY

CI Notes

GSA Contract Names STC

LOUISVILLE, Colo. — Storage Technology Corp. has been awarded a contract by the General Services Administration making STC the mandatory source of supply for all 3420-type tape subsystems for all agencies of the Federal Government.

Revenue from the five-year contract is expected to be at least \$2.5 million and could potentially exceed \$25 million on an "if sold" basis, the firm said. The contract provides for renewals to 1979.

IBM Awarded Data Channel Patent

POUGHKEEPSIE, N.Y. — IBM has received a patent for the data synchronizer used in the 360 and 370.

The data synchronizer, also known as a data channel, permits the computer to process more than one job at the same time without actually interrupting a job in process.

The patent was issued to the three IBM coinventors: Carl L. Christiansen, Lawrence E. Kanter and George R. Monroe.

GTE Enters POS Arena

STAMFORD, Conn. — General Telephone & Electronics Corp. has established a new subsidiary, GTE Comp-Acct, Inc. to provide computerized point-of-sale cash register systems for the food service industry.

The nucleus of the new subsidiary will be the patents, software and other technical knowledge and certain of the assets which were recently acquired from Comp-Acct, Inc., of Cincinnati, Ohio.

Supershorts

IBM has dropped its plan to build a management training center in Ridgefield, Conn., due to community objection to landing helicopters on the site. An alternate site for the center has not yet been chosen, according to the company.

Sycor, Inc. has sold Logabax, S.A., France, a license to manufacture and distribute its dual flexible disk drive in Europe for \$1 million. The unit is expected to be in full production in Paris by the first quarter of 1975.

Control Data Corp. has acquired all of the outstanding common stock of Davidson Computer Services, Inc., a New York firm specializing in the design and development of software applications programs for brokerage firms.

NCR Corp. has reached its target of installing at least 5,000 Century computers with the order of its 5,000th machine by the City of Newport Beach, Calif.

Renegotiate Contract, Limit Funds

Proposals Would Cut Teale Pact Scope

By Molly Upton
Of the CW staff

SACRAMENTO, Calif. — California's \$19.9 million contract with IBM for the consolidated Stephen P. Teale data center and program conversion is coming under increasing scrutiny by state officials.

Two recommendations to reduce and renegotiate the value of the contract were presented to the Assembly Ways and Means Committee here last week.

News that IBM now estimates program conversion for the Department of Motor Vehicles (DMV) on Aug. 4 rather than the established deadline of July 1, and some skepticism that the Aug. 4 deadline will be met, have fanned several questions about the raison d'être of the consolidated data center concept and the selection of IBM as prime contractor.

Harvey M. Rose, state auditor general, recommended that further funding of the IBM contract beyond the 1973-74 level should be discontinued and the contract

renegotiated to require "added performance by IBM for the monies already appropriated in fiscal year 1973-74 in exchange for IBM's failure to perform in a timely manner," as summarized by Vincent Thomas, chairman of the Joint Legislative Audit Committee.

Rose's recommendations included renegotiating the contract, reducing IBM hardware from two 370/156s to one, upgrading Univac equipment on a year's rather than monthly lease, using purchase credits for another Univac computer and dropping the Department of Water Resources and state payroll programs from the contract for conversion.

A sixth recommendation calls for competitive procurement for a single vendor's hardware as soon after conversion completion as economically justified.

Rose estimates these moves would save the state \$8 million during fiscal 1974-75.

A second report, prepared by the office of the legislative analyst and presented by

A. Alan Post, recommended the Department of Motor Vehicles be allowed to seek a DP solution independent of the Teale contract. The report advised that the Teale budget be reduced by \$9.1 million.

Needs Guidance

The Assembly Ways and Means Committee decided it needed legal guidance on whether cutting the DMV free of Teale would affect its ability to later proceed with possible litigation against IBM for its tardiness, and declined to adopt either recommendation.

The committee did, however, accept the second part of the legislative analyst's report, as amended, which charges the legislature with procuring answers from the Department of Finance, the DMV and the Business and Transportation Agency on a number of questions concerning the Teale effort.

The questions seek answers as to when IBM will complete the conversion of all DMV programs, and the date on which the existing DP equipment (Univac) at DMV can be released.

Also, the report calls for a month-by-month estimate on the damages that the state will incur through failure to complete the DMV conversion as scheduled by July 1, and asks if, and how, the state will recover these damages.

Other questions include:

"Why should the state continue the Teale Center consolidation as planned originally?"

"When must DMV make a decision as to the course of action it must take in light of continued conversion slippage?"

Both Rose and Post noted that failure to finish conversion by July 1 would necessitate a substantial expenditure for retention of the current computer system beyond that date.

Rose's report noted that after July 1 the monthly cost of the DMV's Univac equipment would be around \$219,000 rather (Continued on Page 34)

Judge Sees California Cases

Distinct From IBM-Telex Ruling

LOS ANGELES — The final decision in the Telex-IBM case will not affect the procedures in the case against IBM filed by several California firms, U.S. District Judge Ray McNichols ruled here recently.

McNichols noted this should be considered as a new case, but said he would consider certification, which would open this decision to appeal.

An IBM spokesman said "the court's ruling is an encouraging sign that antitrust litigants against IBM will not have to have their cases decided on their individual merits. They will not be able to use the decision in the IBM-Telex case, which is now under appeal, as a substitute for proving cases in court."

However, evidence used in other cases against IBM, such as in the Telex and U.S. Government suits, can be used by the firms involved, McNichols ruled.

IBM made a motion to seek a protective order for the first census, in order to lay the groundwork for allowing the papers to be considered for use in the case.

Judge A. Sherman Christensen in the Telex case has placed these documents under protective order, but has ruled that other courts could obtain the materials.

After arguments were presented by some of the plaintiffs on why they would prefer to wait for the Telex decision than to begin discovery on their own, much of the meeting was devoted to procedural matters in what apparently is a somewhat unusual case.

The plaintiffs include California Computer Products, Hudson Leasing, Marshall, Transamerica and Memorex, each of which had filed separate suits against IBM.

The cases were assigned to one judge and some of the plaintiffs' attorneys questioned to what extent the cases would be consolidated.

Questions ranged from whether the firms, after establishing liability in common, would have damages decided in their local districts.

McNichols said his inclination would be to leave the decision to him as to what extent the cases should be consolidated.

Indeed, the logistics are not simple. McNichols, who resides in Boise, Idaho, and normally operates out of Los Angeles when he's sitting in California, said the case has been moved to San Francisco.

However, he intends to keep in touch with this case through his court clerk in Los Angeles.

50% Growth in 370s

360/370s Put at 19,000 by '76

NEWTON, Mass. — By the end of 1976, the total number of IBM 360/370 systems installed will reach almost 19,000, according to a study by International Data Corp.

This figure includes a decline of 45% in the number of 360 systems, and a growth of over 50% in the number of 370s installed this year, the second 360/370 Migration study said.

The report noted an increase in the use of very large and very small computers, with the number of 360/50 and larger machines jumping from 13% of the total base in 1971 to 16% by 1976.

IDC estimated 370/158s and 168s alone will account for over half of the total dollar growth in 370s between 1972 and 1976.

Leasing companies will encounter increasing difficulty placing their 360 systems coming off lease, the study continued, citing an IDC user survey which showed leasing companies may be left with some 300 out of 950 systems coming off lease in 1974.

The 370 leasing market, on the other hand, looks extremely promising, according to the report, for those firms able to obtain the necessary financing.

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Vertical Integration Critical Cost Factor

Dealers to Lift Microdata End-User Sales

By Molly Upton
Of the CW staff

IRVINE, Calif. — Microdata Corp. is expanding the thrust of its end-user marketing program through the use of dealers.

In addition to its direct sales force which markets to the Fortune "1200," including large financial and insurance institutions, the dealer program allows Microdata to seek the smaller business user.

Microdata does not provide applications



Donald W. Fuller

software. "We've found that the big companies are self-sufficient in this respect," observed President Donald W. Fuller.

The dealers, which are essentially service bureaus with applications software expertise, will be able to provide the user with this type of software, thus enabling Microdata to avoid "applications hand-holding."

End-user sales will play an increasing role in the firm's total mix of end-user and OEM business, Fuller said. For the fourth quarter ending in August, he expects Microdata sales to be 65% OEM and 35% end-user, but for the year they will be 80% OEM and 20% end-user.

However, for the next year, the mix should reach about 60% OEM and 40%



Dale Jacobson tests Series 9000 disk drive.

end-user, he said.

Microdata manufactures all of its CPUs and peripherals except for chips, the printer mechanism and the CRT tube, he said. This vertical integration assures the

firm of being able to control cost as well as quality. Fuller said, noting reliability is a critical factor, not only to customer satisfaction, but to the profit and loss statement.

"Making our own peripherals impresses buyers that we have made a commitment to be around a while," Fuller said.

The firm plans to stay in the OEM market for its separate peripherals and has established a network of sales representatives.

Over the past few years there's been a change in attitude on the part of many large users, Fuller said. "The credibility gap seems to have disappeared," and big users no longer hesitate to buy from small minicomputer firms.

Microdata does not lease its machines, but concentrates rather on applying the techniques it learned in the OEM business of offering an attractive price/performance package, he said.

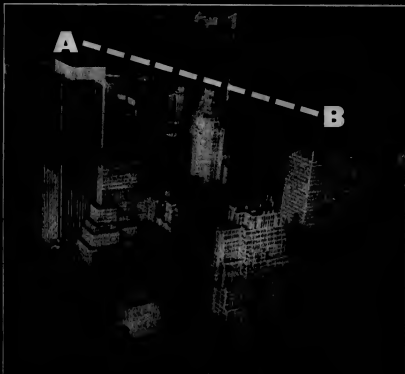


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Proposals Would Cut IBM-Teale Contract

(Continued from Page 33)

than the \$179,000 this year.

Several committee members questioned the validity of the July 1 deadline as established by the Department of Finance as the last possible date for completion of conversion so the state could switch to staggered automobile registration by January 1.

Rose's report noted the Department of Finance had previously stated that program conversion beyond July 1 would mean postponing initiating the staggered registration for one year.

In addition to having ramifications for the DMV and its plans for staggered registration, which also tie in with smog control measures, the slippage on the DMV software raises pertinent questions on the reasons for letting of the contract to IBM.

Rose noted, "This slippage is significant because the administration elected not to enter into meaningful negotiation with all vendors seeking the Teale Center bid, on the grounds that the July date constrained the procurement process, (although Chapter 1167, Statute of 1973 SB 804 which authorized the procurement of equipment and services to implement the Teale Center required such negotiation...)"

Post's report said, "Although the contract with IBM provides for maximum liability on the part of IBM in the amount of \$11.2 million, the contract does not appear to provide for such contingencies as the extra costs the state would incur by a failure on the part of IBM to meet the July 1 conversion date."

Fulton Smith, state EDP director, revealed the state has withheld about \$1 million in payments to IBM since March.

To Exchange Information, Products

USSR, Sperry Sign Cooperative Projects Agreement

By Igor Lobanov

Special to Computerworld

MOSCOW — The Sperry Rand Corp. has concluded an agreement on cooperation with the USSR Council of Ministers' State Committee for Science and Technology.

The agreement calls for the development of business relations with Soviet organizations in almost every Sperry Rand line — commercial computing systems, peripheral equipment and terminals, office equipment, hydraulic systems and units, navigation instruments and consumer goods. Both sides agreed to exchange information, documents, product samples and test results.

They will also exchange delegations, sponsor symposiums, lectures and exhibitions and work together on programs and projects.

The agreement was signed by Dzhermen Gvishiani, vice-chairman of the state com-

mittee, and Paul Lyet, president of the board of directors of Sperry Rand.

"The State Committee for Science and Technology," said Gvishiani, "signed this agreement on behalf of a number of Soviet industrial ministries which are in-

International News

terested in developing cooperation with Sperry Rand. We believe there are great opportunities for mutually beneficial cooperation as well as economic ties.

"The attitude of the company's management and engineers, their readiness to organize an exhibition of their products in Moscow, testify to the serious intentions of our partners," he said.

"For these reasons we assess the agreement with Sperry Rand as one of the

major agreements in the development of scientific-technical cooperation with large American firms," he noted.

"I think this agreement is a result of mutual understanding," Lyet said.

"We recognize there is a real opportunity here for Sperry Rand, through the use of its facilities and capabilities, to participate in what we would say is a very profitable and growing market," Lyet said. "One of the things we are hoping is that we will be able to learn more about what Soviet technology can contribute to Sperry Rand. Hopefully, this technology will be blended into products which will be sold not only in the Soviet Union but in other parts of the world as well."

Lyet spoke favorably of the need to grant the Soviet Union the most-favored nation status in trade. "My opinion is that we should be developing every opportunity to trade with the Soviet

Union," he stated. "We feel the largest step forward we could make would be to have a trade bill with the most-favored nation privilege extended to the Soviet Union."

Lyet, who is a member of the President's Export Administration Policy Committee for American Trade, stated he is striving to get "a proper environment" for business with the Soviet Union, "because we cannot really do a great deal of business until it is possible for the Soviet Union to sell its products in the U.S."

Sperry Rand, in keeping with this agreement, has recently opened a major exhibition of its products in Sokolniki Park here, including an operating 1106 computer system.

USSR Seeking More DP Plants

By Shukan Computer

Special to Computerworld

TOKYO — In an effort to upgrade its market through the introduction of foreign techniques, the Soviet Union has stepped up talks with Japan concerning the establishment of manufacturing plants in the USSR.

With U.S. and Japanese manufacturers competing in the areas of core memory, magnetic heads and disks and batteries, there are reports of some cases where "negotiations are [being carried out] through Japan, but the products are U.S.-made." In other words, Japanese trading firms are negotiating to establish plants of U.S. makers in the Soviet Union.

All of these products, however, run the risk of coming into conflict with the Coordinating Committee for Export to Communist Areas (Cocom) embargo list. For this reason, those makers whose negotiations are partly settled have applied to the Cocom secretariat in Paris for export licenses, but have not yet received replies.

Similar cases are surfacing in connection with inquiries regarding Chinese manufacturing plants in the USSR. Allied industries in the Electronic Machine Industry Association and to approach participating nations, through the Japanese Ministry of International Trade and Industry (MITI) for a relaxation of the embargo. It is hoped the Cocom list will be reviewed and relief obtained within the year.

IBM Orders Component From Australian Firm

SYDNEY, Australia — IBM Australia has placed an initial order for a recently developed aluminum die-casting component with an undisclosed large die-casting company based here.

The component, according to a report in the *Australian Financial Review*, will be sent to the U.S. for testing.

The computer industry generally greeted the announcement with skepticism, viewing the move as a sop to the Australian Government which is still, though less forcefully than before, pushing vendors to purchase or manufacture some components locally.

Qantas, BA Link Centers

LONDON — British Airways and Qantas, the Australian airline, have established one of the world's most extensive commercial computer networks, linking their centers here and in Sydney.

The principal connection, according to the *London Times*, is via the Indian Ocean communications satellite, backed by the Pacific Ocean satellite, land-line microwave across the U.S. and Atlantic Ocean cable.

Norden introduces the first operational Millimeter Wave Radio.

For the first time, there is a practical alternative to cable for short-haul transmission. It's the first in a family of telecommunication products now being introduced by the Norden Division of United Aircraft Corporation.

The new Norden Millimeter Wave Radio operates at high frequencies soon to be opened for local transmission. Available now — under FCC developmental license pending final rule-making — Norden radios are already entering service.

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Produced in 22 GHz and 39 GHz models, the Norden radio is a solid-state, full-duplex, transmitter-receiver system. It carries a digital bit stream at T1 or T2 rates. Power requirements are

low, and the radio runs off commonly used battery plants, or 115V AC. Humidity and extreme temperatures won't bother it.

And a family of multiplexers

This remarkable new radio is part of a Norden family of telecommunication products, including: a time division multiplexer with four inputs and an output of 6.3 Mb/s, a voice multiplexer with 24 inputs and an output of 1.54 Mb/s, and a data time division multiplexer with 23 inputs and an output of 1.54 Mb/s.

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Canada Narrows Bids for TP System

By Gordon D. Hutchison
Special to Computerworld
OTTAWA, Ont. — The Canadian government has narrowed the bidding for a replacement \$52 million message switching system for the Armed Services to three firms: Burroughs Business Machines Ltd., Canadian National Telecommunications and Sperry Univac. All have met qualifying specifications for the

amination of the proposals.

Bidders were required to meet minimum specifications on technical performance, operational suitability, price and Canadian industrial involvement.

The project has been labeled Samson — strategic automatic message switching operational network — and is similar in application to Autodin. It is to replace an antiquated torn-tape message system which has been used since the Second World War.

A final selection and contract award is expected to take place

in late summer.

Terminal Contract

Also in the second phase of tendering is the terminal requirements for Samson. The system will use 450 teleprinters and 200 data preparation units, as well as about 150 slow-speed teleprinters already in inventory.

Five companies submitted bids for the estimated \$6 million contract. The field has been narrowed to Teletype Corp. and Computing Devices of Canada. Samson is scheduled to be operational in early 1976.

International News

high-level network portion of the system.

Six message switching computers are needed for the system, plus 15 minis to act as communications controllers and concentrators.

This portion of the job is valued at approximately \$20 million.

Five bidders submitted tenders for the project late last year. Canadian Pacific Telecommunications and Honeywell Controls were knocked out of the competition after an in-depth ex-

Airport Controls Passenger Data

Special to Computerworld
RINCWAY AIRPORT, England — An airport extension designed to handle Jumbo-Jet airliners has computerized its passenger information and building maintenance systems.

Handling the passenger side is a GEC 2050 computer with 40K bits of core and 160K of disk backup.

Five passenger lounges are equipped with Infotux information display boards, with smaller versions at each passenger gate and about 35 CRTs at other strategic points throughout the terminal, with the whole system linked to the passenger information control desk.

Backing the day-to-day operation of the system is a stored weekly timetable which is prepared off-line on paper tape, and updates are carried out either on-line through a CRT, or off-line by paper tape.

The maintenance control system was supplied by Honeywell with a System 6 Selectographic Supervisory Data Center monitoring the heating and ventilating systems. Through the system there is a one-man control and logging of status at up to 1,000 points, including annunciation of alarm conditions.

There is also an audio system through which the operator can direct maintenance personnel to any given spot.

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Computerhouse Rents DP 'Studios'

AMSTERDAM, The Netherlands — A new concept in computer services is being introduced here under the auspices of Combinatie Samenwerkende Rekencentra B.V. (CSR).

CSR has moved to a new facility housing an IBM 360/20 (32K), an IBM 370/125 (128K), a Burroughs B3700 (200K) for on-line real-time applications and a Siemens 4004-135 (128K).

Within the facility, called Computerhouse, CSR will continue its current service and software facilities, as well as rent "computer studios" with terminals linked to the central computer system.

These studios will be available for hire, permanently or temporarily, by firms using the CSR systems, thereby affording them a total service package which can be used on an hourly basis, CSR said. The firms will be able to make use of the facilities of a computer service bureau, software house, keypunch center, training institute and meeting and instruction rooms.

Survey Finds Many Postponing Installations

Recession Puts Damper on Japanese DP Development

By Shukan Computer

Special to Computerworld

TOKYO—Almost 20% of companies surveyed recently are postponing or cancelling new computer installations because of Japan's recession.

Sixty percent of the 674 survey respondents are continuing DP operations according to pre-arranged plans despite the recession, according to the Japan Electronic Computer Center (JECC), which conducted the research.

The real estate and paper in-

dustries indicated the heaviest cutbacks in DP expenditures; little difference was observed in whether the users had Japanese or imported equipment.

Thirty-two companies, or 4.7% of the respondents, were postponing new installations, while 102 companies—15.1%—indicated additional equipment in existing centers was to be delayed.

The conversion of low-priority tasks to manual operation involved 76 companies or 11.3%; the cessation of computer uti-

lization altogether, nine companies; and returns of portions of the hardware, four companies. Seven companies are

International News

switching to the use of service bureaus; conversely, 36 firms are undertaking work from the outside—each devising its respective conversion plan.

Probably the strongest counter-

measure being taken is raising the efficiency of computer utilization; 507 firms or 75.2% have some plan to improve operations.

The general trend does not show big differences when the firms are classified by capital or scale of total sales, the survey noted.

Classifying users into those using domestic equipment and those using imports, many were found to be proceeding with pre-arranged DP plans regardless of the recession: 61.5% for domes-

tic users and 57.4% for import users.

Even those making postponements altogether—excepting emergencies—come to 14.3% for the domestic user as against 16.3% for the foreign. However, overall postponement of new installations is 6.1% among users of domestic equipment and 4.7% among import users.

Classified by industry, those replying that they are generally postponing new installations are the real estate business (33%), pulp, paper and paper processing industry (14.3%), electric machine manufacturers (13.7%) and general machine manufacturers (10.4%). Those making postponements altogether—excepting emergencies—are the mining industry, petroleum producers, petroleum products manufacturers and manufacturers of transportation equipment.

Why Computerize?

As the principal factors influencing the use of DP, coping with expanded future projects (50.1%) and the streamlining of simple business via automation (45%) were cited with overwhelming frequency, followed by the rapid acquisition of management data (39.5%), cost reduction while meeting rising personnel expenses (29.6%), automation in response to increasingly complex office procedures (25%) and the coverage of labor shortages (22.9%).

On the other hand, such motives for utilization as MIS (19.3%) and the qualitative improvement of management (18.3%) were also cited by a considerable number.

Regarding the introduction of DP, when recommendations come from parent or affiliated companies, they are limited to industries having close parent company-subcontractor relationships, the survey said. Improvement of customer service is a powerful motivation in the financial business (23.5%), insurance business (40%) and in data processing services (33.3%).

Univac Acquires On-Line

HONG KONG—Sperry Univac has acquired the major assets of On-Line Operations, in Hong Kong and Singapore, from Wheelock Marden & Co.

Under the terms of the agreement, all marketing and support activities in the major areas previously served by On-Line Holdings Ltd. will now be performed by Univac's Asia-American Division.

On-Line Holdings had been providing marketing and related services for users of Univac computers and peripherals in Hong Kong and Singapore.

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CATV Design Program Selects Routes, Equipment, Materials

NEW YORK—Despite published reports of political and economic "set-backs" in the future growth and development of large-scale cable TV systems in densely populated areas, Network Analysis Corp. (NAC) is experiencing a 47% gain in its installation volume, according to William W. Williams, vice-president of marketing.

NAC, which specializes in designing cable systems in already built-up metropolitan areas, saves clients money through computer-aided selection of routes, equipment and materials, Williams said. Williams claims NAC's proprietary program allows the firm to produce entire CATV systems from the ground up in less than half the time it would take using the more conventional manual approach.

This saves clients not only time, but costs as well, to the tune of from 8% to 40%, Williams said.

Costs that have slowed down cable installations recently have resulted from

new FCC requirements—a minimum capacity of 20 channels and the provisional capability of two-way service.

Secondly, most cables have to run underground, meaning new cable operators have to commit themselves much sooner, to far-reaching technical and financial decisions at the proposal stage.

Next, a properly designed cable system must deal with variables such as cross-modulation, noise, band-width, temperature variations, alternate routes and component specifications. Only by simultaneously considering and specifying all design parameters can the most money be saved.

"Human designers have not been able to do this," Williams said.

"Because the computer doesn't rely on human intuition or feel wedded to routine approaches that may have been used successfully in the past, it is free to select the best route based on the facts pertinent to the job at hand," he concluded.

Expansions

Cambridge Memories, Inc. plans to consolidate its major Massachusetts operations in the Bedford Research Park, Mass. where it already occupies a 55,000-square-foot building. The company has leased an additional 65,000-square-foot plant.

Applied Data Communications has expanded its manufacturing facilities to an adjacent building, adding 5,000 square feet for engineering and production.

Electronic Memories and Magnetics Corp.'s Military Products Division has added 20,000 square feet to its facilities to accommodate increased production volume.

Memory Technology, Inc. has moved to corporate facilities at 533 Boston Post Road, Weymouth, Mass.

Sperry Univac has acquired an additional 131,000-square-foot manufacturing facility in Naples, Italy, for the production of data entry equipment.

Burroughs Corp. plans to construct a business forms manufacturing plant in Rocky Mount, Va.

Cosp Systems, Inc. has recently moved its corporate headquarters into larger facilities on Long Island at 175 I.U. Willets Road, Albertson, N.Y.

NCR

ACCOUNTING COMPUTER DIVISION

In considering the job you have today, you have to consider tomorrow. In fact, you have to consider a series of tomorrows that form your future. NCR's Accounting Computer Division in Wichita offers opportunities for ambitious individuals who are interested in today and concerned about tomorrow. For professionals seeking a pleasant working and living environment. For career minded people who are willing to be measured by their performance. For those who want personal growth, technical development, responsibility and diversity.

Systems Software Programmers

- FIRMWARE DEVELOPMENT
- MINICOMPUTER OPERATING SYSTEMS
- COMMUNICATIONS
- FILE MANAGEMENT
- ASSEMBLERS
- COMPILERS

We presently have openings for experienced Systems Software Programmers. Opportunities exist in the design, implementation and support of minicomputer operating systems, communications, management, assemblers and compilers. Senior positions in processor design with an emphasis on virtual machines and operating systems for systems.

If you are qualified and interested in any of the above opportunities, please send complete resume including salary history and requirements to Mr. Don Wilds, Professional Placement, P.O. Box 1297CN, Wichita, Kansas 67201.

An Equal Opportunity Employer M/F

INDUSTRY APPLICATION STUDIES

IDC is pleased to announce

the publication of the following studies:

To: Walter E. Misdorn
VP Industry Analysis
International Data Corp.
60 Austin Street
Newtonville, Mass. 02160

Please send further information () or copy (copies) of the _____ report. Check enclosed () or bill me ().

Name _____

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Right now! The demand for your specialized services is at an all-time high. So employers are entirely responsive to your career objectives... income... position... challenge.

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Contact our office nearest to you, and place your career in the hands of the professionals.

esp associates

SYSTEMS DEVELOPMENT MANAGER

A growth computer manufacturer, located in Northern New Jersey, offers a ground floor opportunity to a professional with 5-10 years' systems and programming experience with minicomputers and peripherals, including disc systems. You must be familiar with commercial applications, as well as close involvement with input of systems software needs to a software design group.

To perform successfully in this position, your experience and knowledge should include: intelligent or non-intelligent communications terminals; micro- and macro-software; computer architecture. Good communications skills with all levels of management will be required.

For prompt, confidential consideration, send your resume. Starting salary will be \$21,000. Our staff knows of this position.

BOX 4123

797 Washington St., Newton, Mass. 02160
An Equal Opportunity Employer

'COMPUTER CENTER DIRECTOR'

To direct activities of Cooperative Computer Center for three Chicago-area public Universities. Applicant should be college graduate with administrative experience in higher education data processing practices, including teleprocessing. Position is to be filled by July 15, 1974. Send resume to Cooperative Computer Center Committee, Secretary, Board of Governors of State Colleges and Universities 222 South College Street, Springfield, Illinois, 62706. An Equal Opportunity Employer.

MOVING?

Please notify *Computerworld* at least four weeks in advance. Include both old and new addresses. When writing *Computerworld*, please enclose a recent mailing label. The code line on top may not mean much to you, but it is the only way we have of quickly identifying your records. If you are receiving duplicate copies, please send both labels.

COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160

POSITION ANNOUNCEMENTS

COMPUTER

CENTER DIRECTOR
Hiram College invites applications for this position. The Director supervises operations at the Center, which serves all administrative offices and provides technical assistance. A major responsibility will be to direct the staff of approximately 15 IBM 1130 to a PDP 1140 and the other computer systems, including a terminal network.

The Director should have a Master's Degree in Computer Science or equivalent background in programming and systems analysis, experience with IBM 1130 and 1140, ability to program in Cobol and Fortran, and have an understanding of an assembler language. Salary will be commensurate with academic background and professional experience.

Send resume, references, and salary requirements to: Dr. Thomas J. Hiram College, Hiram, Ohio 44234.
An Equal Opportunity Employer

Systems Programmer

Immediate opening for a software support person with a minimum of three years experience in S. I. Inc. C/PAY 1 installation, maintenance, and generated programming services in a university environment is desirable. The position entails development and support assignments for basic systems software on our newly acquired 360/67. Should include salary history. Please write to:

Director for Personnel
Rensselaer Polytechnic Institute
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Opportunity to get involved in all Ordinary CFO responsibilities. You will be working with a very talented staff of programmers on one of the most technically advanced CFO installations in the country. If you really know CFO and Data Processing, you're the best I want. Enjoy the best working conditions and best living areas in the U.S. An outstanding opportunity to join an organization that is really on the move.

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Miami, Florida 33131

POSITION ANNOUNCEMENTS

FACULTY POSITION IN COMPUTER SCIENCE

September 1974. Assistant Professor. Doctorate Preferred. Teaching experience or capability in non-numeric computation or systems analysis and commercial applications required. Please respond with programming language and teaching experience to Dr. John F. Dalphin, Chairman, Computer Science Department, State University of New York, Potsdam, New York 13676.

An Equal Opportunity/Affirmative Action Employer.

SYSTEMS ANALYST

A growing Information Systems Department in Denver, Colo., has an excellent opportunity for a Systems Analyst with extensive manufacturing experience.

We are looking for a person with:

- Minimum 3-5 years experience as a Systems Analyst in manufacturing and inventory applications
- Capability of analyzing projects
- Ability to communicate effectively
- Knowledge of Data Base Systems
- FORTRAN and COBOL Experience
- Hands-on equipment background

If you feel you fit the above description please send a detailed resume of education, experience, responsibilities, and salary desired to:

Rocky Mountain/Orthodontics

P.O. Box 1887, Denver, Colorado 80201

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COMPUTER SYSTEMS ANALYST - STUDENT INFORMATION SYSTEMS

Professional position available July, 1974. Large multi-campus university is undertaking comprehensive design of a student data base and student information system. This position will have responsibility to do all information gathering, user department interface during design and implementation effort carried on by the University Management Systems Group. Background: Experience in student record systems and systems design. Data base experience also desirable. Send resume and references to:

Director of Computing Services
UMASS-BOSTON, Harbor Campus
Boston, Mass. 02118
An equal opportunity employer.

DIRECTOR OF MARKETING

Nationwide data processing company seeks experienced director of marketing. The company has offices throughout the United States and is growing world wide.

Candidates should have the following qualifications:

- Sound data processing background
- Proven sales record
- A solid grasp of business and accounting practices
- Management experience directing marketing activities
- Desire to be associated as a key executive with a rapidly growing company.

This position has an excellent salary and benefits program with no upper limit on growth potential. Send resume and salary history to:

CW Box 41
797 Washington St.
Newton, Mass. 02160

Computerworld Sales Offices

Vice President-Marketing: Neal Wilder. Sales Administrator: Dottie Travis. Computerworld, 797 Washington St., Newton, Mass. 02160. Phone: (617) 965-5800. Telex: USA-92-2529.

Northern Regional Manager: Robert Ziegler. Account Manager: Mike Burman. Computerworld, 797 Washington St., Newton, Mass. 02160. Phone: (617) 965-5800. Telex: USA-92-2529.

Eastern Regional Manager: Donald E. Fagan. Account Manager: Frank Gallo. Computerworld, 2125 Center Ave., Fort Lee, N.J. 07024. Phone: (201) 461-2675

Los Angeles Area: Bob Byrne. Robert Byrne & Assoc., 1541 Westwood Blvd., Los Angeles, Calif. 90024. Phone: (213) 477-4208.

San Francisco Area: Bill Healey. Thompson/Healey Assoc., 1111 Hearst Bldg., San Francisco, Calif. 94103. Phone: (415) 362-8547.

POSITION ANNOUNCEMENTS

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SYSTEMS SOFTWARE PROGRAMMER

Communications

Our accelerated research and engineering development growth has opened a new opportunity. LITTON ABS has a position for a professional with 5-6 years in systems software, plus 2 years in communication, using 8-synchronous and 16-synchronous devices. Experience with BTAM will be important, including intelligent terminals and IBM 3741, as well as Assembler and FORTRAN languages.

We offer a comprehensive employee benefits package, as well as a professional environment. Send your resume in confidence, including your current salary, to Mr. L.H. Ryan, c/o Professional Development, 34 Maple Avenue, Pinebrook, New Jersey 07068.



LITTON ABS
Automated Business Systems

An equal opportunity employer m/f
A written affirmative action program

Data Processing Training Coordinator

To assist managers and supervisors prepare individual career development plans for their technical and professional staff.

To prepare and administer a multimedia training program for all DATA PROCESSING and non-EDP functions in Corporate Systems Dept. including, but not limited to:

- Computer Operations: Production Scheduling, Control Procedures, OS/VS Job Control Language, Batch and Timesharing.
- Programming: Assembler, COBOL and FORTRAN languages.
- Systems Analysis and Design: EDP Systems, Procedures and Forms Design.
- Professional Data Processing Management Development.

The successful applicant will have a Bachelor of Science or Bachelor of Business Administration degree and five years proven ability in Data Processing — preferably on an IBM 360/65 or larger computer. Demonstrable proficiency in the design, programming, conversion and operation of large scale applications is preferred. Experience in teaching or administering high technology courses is highly desirable. The ability to communicate effectively (orally and in writing) with superiors, peers and students is required.

Qualified applicants who wish to be considered for this challenging position in one of the most progressive and innovative Utility installations should mail their resume and salary requirements to:

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Florida Power & Light Company
P. O. Box 013100
Miami, Florida 33101



FLORIDA POWER & LIGHT COMPANY

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MANAGER

Systems and Procedures

This position requires an individual capable of assuming responsibility for the establishment and implementation of systems and procedures for a dynamic organization. An additional activity will be administration of some office service functions. Requirements include a strong industrial accounting background with a minimum of 8 years experience in all phases of manual and computerized systems. Appreciable administrative experience is also a requirement.

Please send your resume (including salary requirements) to Mr. Gary Levesque.

JOHN MEYER
APPAREL DIVISION

W.R. Grace Co.
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Male and Female

SYSTEMS ANALYST

System Analyst needed for University Computer Center. Applicant must include: (1) M.S. degree in business office, etc. (2) Desire experience in Computer programming and implementation. (3) Submit resume of education and experience together with salary requirements to:

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Major investment banking firm seeks a college graduate with approximately 1 year of commercial programming experience under COBOL or C. Knowledge of JCL and DASD files essential. We will train you in COBOL, BAL.

Excellent opportunity, challenging situation, liberal benefits.

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The individual we seek should have a degree in math, computer science, or related area; 5 years experience in hardware and software evaluation, selection, contracting and internal development with a good track record of accomplishment through effective administration and management of people; and good verbal and written communication skills. The incumbent is responsible for all technical needs of the M.I.S. Department including data communications, technical training, computer microfilm and documentation. Burrough's background highly desirable. Excellent benefits.

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Systems Development For On-Line Banking

Electronic funds transfer and automated banking systems are projected as major growth markets for the next decade, and we offer solid opportunities for engineering professionals to participate in this growth as we expand our development of mini-computers and micro-processor customer terminals and data communication systems for financial institutions.

Software Development Engineers

At least three years experience in the design of architectural and/or application software for mini-computer and micro-processor controllers used in on-line systems.

Degree in E.E. or Computer Sciences a requisite. On-line data communications experience and familiarity with banking highly desirable.

Data Communication Engineers

Three to five years experience in the design of on-line digital communication systems necessary. Degree in Electrical Engineering a requisite.

Electro-Mechanical Engineers

Three to five years experience in the design and development of advanced terminals and data transfer systems highly desirable.

If you seek an engineering challenge as well as an opportunity with the leading equipment systems supplier to the financial field, send your resume in confidence to C. J. Maurer.



An Equal Opportunity Employer M/F

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100% CLUB

We are a dynamic well known computer sales firm expanding offices throughout the United States.

If you have a solid background in control data equipment sales and are looking for an unlimited future with accelerated compensation, you can't pass us up. Your creative talents will be recognized. Write in complete confidence to:

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Our employees are aware of this ad.

BILL OF MATERIAL PROCESSOR WANTED

We are a worldwide manufacturer of very large custom built machinery with 500,000 potentially active BOMP records to maintain. Design engineers in need of accurate record and new and reused drawings are released for manufacturing in stages over up to 24 months. Thus, the logical structure of the product cannot be completely defined at order entry.

The BOMP for this application must:

- 1) Use IBM-11 on IBM 3/350-50 (312K) under OS.
- 2) Allow archiving of semi-used bills with rapid retrieval when needed.
- 3) Preferably utilize COBOL.
- 4) Maintain chains for both implosion and - explosion processing to give us the ability to print hard copy, indexed bills of material, and customer order identification.
- 5) Allow the chains to be re-nitized just prior to shop orders being mailed.

1) Handle reference, sized, label, and revision to engineering drawings flexibly and efficiently.

It is required that a logical subset or alternate form of the above be capable of being tailored to fit smaller S/370 and the S/360 computers utilizing DBCOMP under DOS for use on the same and more standardized product lines in other manufacturing plants.

If you have a BOMP to fit our needs, contact us at:

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787 Washington Street
Newton, Mass. 02459
or call R.C. Schultz
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Career Opportunities For Programmer/Analysts And Systems Analysts

Has the potential for career development levelled off in your organization? You may want to involve yourself in the development of systems in a university environment. We need creative approaches to applications in student record and personnel systems backed by an IBM 370/145 center with on-line. An unusual opportunity for your own development both on and off the job. I would like to hear from you because of your 3-5 plus yrs. of solid exp. in a medium to large installation. BAL/COBOL a must for programmer/analyst with on-line. Mark IV, TMS, and project leader exp. helpful. Exp. in financial application preparation and presentation a must for systems analyst with communication and information systems and project leader exp. helpful.

Ask me about coursework at no cost to you, a 4 day week option and our vacation program. Salary depends on qualifications.

Please send resume or call Rod Johnson, (612) 273-5390, PERSONNEL DEPARTMENT, 6851 University Ave., St. Paul, MN 55114.

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an affirmative action employer

AUTONOMY.

If you're the creative, independent type, and you're looking for a company that offers a concept of autonomy with unrestricted opportunity for professional growth, you should consider Digital.

These positions are with our beautiful new Marlboro, Mass. facility - approximately 1 hour driving time from Boston, Hartford or the N.Y. thruway.

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If you enjoy working in an active atmosphere and feel completely at home with responsibility - read on.

You'll need a BS in Math, Physics, Engineering or Computer Science or the equivalent. You should also possess 4 years experience in software development for large computer systems of which at least 1 year should have been with supervisory responsibility.

As part of this aggressive team, you'll be responsible for supervising a sharp, highly qualified group of Senior Programmers involved in our DECsystem 10, large computers. Your major function will be to oversee the specifications, design and implementation of operating systems. Good communicative skills are essential, since you'll be expected to interface with marketing to define products.

Senior Software Engineers

As an integral member of this highly professional group, you'll be involved in developing new commercial software products in our DECsystem 10 area. You'll receive as much responsibility as you can handle in an atmosphere that encourages complete and total creativity. Give us a BS in

Math, Physics, Engineering or Computer Science, or equivalent with 3-5 years software development experience in COBOL compiler - development or related background in data management systems development or file access methods and we'll give you an incredible opportunity.

Senior or Principal Programmers

In this high visibility position you will develop enhancements for communications facilities in a large scale state-of-the-art general purpose time-sharing operating system for the DECsystem 10.

Your initial assignment will involve the required system analysis followed by design and implementation of improvements to total system throughput for asynchronous terminals connected to local

front ends and remote stations.

Ideally, you should have a minimum of 3-5 years in operating systems development and maintenance with extensive background in synchronous and asynchronous communications. A strong network background and some experience with the DECsystem 10 are desirable, but not required.

Senior Systems Programmers

Several excellent growth positions now exist in the Operating Systems Development Group for the DECsystem 10. Your general responsibilities will include developing support for new hardware devices and advanced software features for the large scale, general purpose operating system for the DECsystem 10.

Initial duties will also include design, implementa-

tion and testing of modifications to the existing operating system to support major new hardware developments.

2-5 years minimum experience desired in developing and maintaining operating system software. DECsystem 10 experience preferred but not mandatory.

Senior Programmer

We have an unusually attractive position for a creative and energetic programmer to develop communications software for use with a large scale, state-of-the-art, general purpose time-sharing operating system for the DECsystem 10.

Initially, your involvement will include design, implementation and testing of synchronous line

support for a new communications front end.

Your experience should include 2-5 years in operating systems and synchronous and asynchronous communications. DECsystem 10 and/or PDP-11 experience desirable but not required. Background in networks is preferred.

Please send your resume to Lee Callahan, Digital Equipment Corporation, Dept. 605, 200 Forrest Street, Marlboro, Mass. 01752.

digital
digital equipment corporation

The above positions are open for application to women and men regardless of race, national origin, age, religion, or creed.

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PROGRAMMER

A leading midwest based firm currently has a vacancy for an experienced professional on its Programming staff. We prefer a Bachelors degree and require 2 years background in ANCOBOL, GOMVT, and JCL.

We offer continued professional growth through implementation of current technology and the development of large on-line systems using Data Base facilities. We are also moving toward a VS environment on large scale hardware.

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Newton, Mass. 02160

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DEVELOPMENT MANAGER

UNITED BANKS SERVICE COMPANY
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We are committed to the development of one of the most advanced computerized banking systems in the country and are seeking for an energetic and mature individual to take over the management of a select group of computer professionals who are responsible for completing the design and implementation of our own on-line integrated data base system. This system, being implemented under VS2 on an IBM 158, is comparable in scope, complexity and functional capability to IMS.

The individual filling this position must have proven managerial experience, and a strong technical background with thorough knowledge of COBOL, VS, and HASP systems and also be fully conversant in both PL/I & BASIC. An in-depth familiarity with current data base software architecture is also required.

This is a unique opportunity to move to one of the most beautiful areas of the country and to work in a challenging, creative environment. The individual is responsible for the design of computer applications for a financial institution in the Rocky Mountain region. Salary is commensurate with qualifications and experience. Excellent benefits and pleasant working conditions in the Southwest suburban Denver Technological Center. Send a detailed resume, including salary history, to:

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P.O. Box 1290
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DIRECTOR OF
COMPUTER SERVICES

Experienced commercial analyst/programmer to develop college applications and support operations of IBM Systems 3, Model 10 installation. Be able to direct key-punch operations and interface with faculty users. Familiarity with COBOL, FORTRAN and RPG II important. Knowledge of accounting and academic environment helpful.

Contact:
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Arkansas College
Batesville, Ark. 72501.

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Write it yourself!

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Dept. DP

359 Jersey Ave.

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SYSTEMS

If you desire the challenge of guiding the development of manufacturing systems for a multi-plant division headquartered in Pittsburgh, and have the necessary qualifications of maturity, experience, initiative, and creativity... we should compare objectives.

The ideal candidate will have a knowledge of RJE, OS/2000, MRP and IMS, with a background in systems and industrial engineering. Position requires moderate travel. Salary to low \$20's. If interested, send resume to:

BOX# 4122

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Newton, Mass. 02160
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SYSTEMS
SUPPORT
INCORPORATED

BEAT INFLATION IN
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VIRGINIA BEACH, VA.

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We are specifically looking for experience in:

- *Command & Control Systems
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- *Real Time Programming
- *C/S, C/M, S/2 Programming
- *Multi-Processing System

Experience in the following computers is desirable:

- *UNIVAC CP-642 A/B, 1230 AN/UYK-7
- *UNIVAC 501/1830/1832A
- *Texas Instruments CP-967/UYK

For consideration, please send resume in confidence to:

JOHN CROWLEY

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REI's 2nd Quarter Gains Don't Offset Loss in 1st

DALLAS — Although Recognition Equipment, Inc. (REI) scored a profitable second quarter, the gains were not sufficient to offset losses in the first period, with a resulting sixth month loss.

Second quarter earnings of \$526,000 or 11 cents a share, compared with a loss of \$1 million or 21 cents a share in the year-to-date period, were attained despite an almost \$1 million charge for costs above the firm's contract price for its Trac system.

In addition, REI showed other charges of \$285,000 for provision for losses on receivables and \$235,000 for losses on translation of currencies.

These charges were partially offset by unusually high revenues from outright purchases of equipment during the quarter, observed President Jay Rodney Reese.

Quarterly revenues rose to \$12.3 million from \$10.5 million in the year-to-date period.

Revenues Up 42% At National CSS

NORWALK, Conn. — National CSS, Inc.'s revenues for the year ended Feb. 28 rose 42% as earnings climbed to \$18 million or \$1.62 a share compared with \$15.5 million or \$1.37 a share last year.

Income before special credits more than doubled to \$16 million or \$1.43 a share compared with \$779,026 or 72 cents a share.

Revenues rose to \$23.7 million from \$16.7 million in 1973. In the fourth quarter, the firm earned \$502,598 or 44 cents a share including a \$52,200 tax credit, compared with \$464,119 or 43 cents a share last year when there was a \$232,985 tax credit.

Revenues jumped to \$6.8 million from \$4.6 million.

The full impact on earnings and revenues from the acquisition of TBS Computer Corp., which occurred during the fourth quarter, will not be realized until the next quarter, said President Richard H. Orenstein.

In the six months, REI lost \$721,000 or 14 cents a share compared with a loss of \$564,000 or 11 cents a share in the same 1973 period.

Revenues totaled \$19.1 million, up from \$18 million last year.

Equipment Shipped

The purchase value of equipment shipped in the first half amounted to \$12.1 million, up from \$4.9 million in the 1973 period.

As of April 30, the backlog of signed contracts was \$22.8 million in purchase value, compared with \$24 million last year.

MAI Records Second Profitable Quarter

NEW YORK — Management Assistance, Inc. (MAI) recorded two consecutive profitable periods for the second time in the past seven years.

MAI, which includes Basic/For, Sorbus, Genesis One and Xerox, earned \$373,000 or 2 cents a share in the quarter and \$512,025 or 3 cents a share in the six months.

In the second quarter, revenues rose to \$18.5 million from \$15.2

million in the same period a year ago, when the firm lost \$523,550 or 3 cents a share.

In the six months, revenues rose to \$35.9 million from nearly \$31 million in the year-to-date period, when the loss was \$281,175 or 2 cents a share.

In both periods, revenues from rentals declined, to \$5.2 million in the quarter from \$6.9 million last year, and to \$10.7 million in the six months compared with

\$14.4 million in the 1973 period.

Results of operations for the periods are not entirely comparable, observed President Raymond P. Kurshan, because sales from older equipment are reflected in the consolidated statement of operations since the third quarter of fiscal 1973, when the domestic residual value account was realized.

Prior to this, such sales were reflected as a recovery of the residual value on the balance sheet.

Also, there has been a change in the classification of credit for interest waived by lenders.

Datapoint Hopes to Exceed Target Of \$1/Share Earnings for the Year

SAN ANTONIO, Texas — After looking at the results of its third quarter, Datapoint Corp. is confident it will exceed its target of \$1 per share earnings for the year ended July 31.

Earnings in the three months ended April 30 rose to \$937,000 or 46 cents a share compared with \$592,000 or 32 cents a share in the same year-ago period.

Earnings for the quarter nearly doubled to \$10.3 million from \$5.3 million in the year-

ago period.

In the nine months, revenues rose 104% to nearly \$25 million from \$12.2 million. Earnings totaled \$2.5 million or \$1.23 a share, including \$825,000 tax credit, compared with earnings of \$1.1 million or 64 cents a share, with a \$534,000 tax credit in the 1973 period.

The purchase value of equipment shipped for sale or lease during the third quarter increased 145% to \$21.6 million from \$8.8 million a year ago.

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AMS Investments Near \$3 Million

SUNNYVALE, Calif. — Advanced Memory Systems, Inc. (AMS) received a \$2.95 million infusion of capital through investments by RCA Corp. and other firms.

An additional agreement calls for AMS to develop MOS memories over a three-year period and includes delivery of AMS 7001 chips to RCA's Solid State Division.

Under the agreement AMS will proceed with developments based on RCA's complementary metal-oxide semiconductor (CMOS) and silicon-on-sapphire (SOS) technology, including RCA's CD4061A 256-bit random access memory and the recently announced CMOS microprocessor.

The 7001 chips will enable RCA to enter the memory market and to act as a second source for AMS, according to Bernard Vondereschmitt, vice-president and general manager of RCA's Solid State Division.

RCA made a \$2 million investment in AMS through the purchase of 20,000 shares of nonvoting preferred stock, while Resemmer Securities Corp. bought 7,500 shares of voting preferred stock for \$570,000 and Sutter Hill Ventures purchased 2,000 shares for \$200,000.

Both series of stock are subject to investment letter restrictions and are convertible directly or indirectly into common stock at \$5 per share.

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Earnings Reports

WANG LABORATORIES

	1974	1973
Shr Ernd	8.29	8.26
Revenue	16,026,581	12,919,741
Earnings	1,165,644	1,042,051
9 Mo Shr	.74	.44
Revenue	43,851,106	32,994,081
Earnings	2,985,674	1,760,806

MACRODATA

	1974	1973
Shr Ernd	\$22	\$1
Revenue	3,000,076	1,339,69
Earnings	178,389	133,22

COMPUTAX SERVICES

	1974	1973
hr Ernd	\$ 71	\$ 71
Revenue	12,480,611	11,500,183
Expenses	8,222,222	7,999,999

GRAHAM MAGNETICS

	1974	1973
Per Ernd	\$.98	\$.73
Revenue	11,178,749	8,263,333
Earnings	920,154	680,091

SANGAMO ELECTRIC
Three Months Ended March

	1974	1973
hr Ernd	\$.71	\$.40
Revenue	26,034,000	23,516,000
Spec Cred	\$ 371,000
Earnings	1,902,000	1,092,000

HARRIS-INTERTYPE

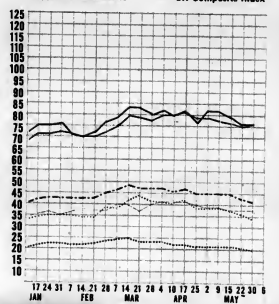
Three Months Ended March 31		
	1974	1973
Shr Ernd	\$.80	\$.68
Revenue	121,701,000	114,507,000
Earnings	5,005,000	4,153,000
9 Mo Shr	2.35	1.88
Revenue	357,561,000	309,876,000

INCOTERM

	1974	1973
Shr Ernd	\$.92	\$.85
Revenue	16,584,000	11,602,000
Tax Cred	541,000	480,000
Earnings	1,603,000	1,322,000

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Computerworld Stock Trading Summary

[illegible]

CIG 145 Memory:

Top Line Features. Bottom Line Price.

1 PLUG-IN UPGRADES

Need more memory? Plug it in. Each of the eight Basic Storage Modules (BSM's) of the CIG system can accept up to 256K bytes of plug-in semi-conductor memory. So when you need more memory, you'll get it. Fast.

2 DOUBLE CAPACITY

IBM: One meg
CIG: Two meg's
The CIG/145 has dual gates each of which contains up to a full megabyte of main memory. Up to 2,048K bytes in one compact unit. CIG's double capacity. Twice the memory IBM can give you.

3 MODEL CHANGES

Every CIG/145 memory system includes the proper model change required to upgrade your 145 CPU to its new storage capacity. So you save twice. Once on the memory system. Once on the model change. Both from CIG.

4 REALLOCATION

The CIG/145 will reallocate any segment of main memory in 128K increments. So if you do have a problem, you move it where it hurts you least. In fact, your CIG/145 system will even cover-up for failing IBM memory. All under operator control.

5 INVISIBLE MEMORY

Throw a switch and we'll disappear. Really! CIG's on-line/off-line switch will make your 145 think its CIG memory was never there. So if IBM has a problem, they can't point at us, 'cause they can't find us. We're invisible!

6 ECCL

CIG's Error Checking and Correction Logic. It keeps your system up even if the chips are down. In fact, the CIG/145 can continue to operate with an entire 32K bit memory card out. Because each card contributes only one bit per word. And our ECCL automatically corrects all single bit errors.

7 FOUR LEVEL DIAGNOSTICS

The CIG/145 allows four levels of integrated diagnostic support: 1) Off-line operation from the integral test panel. 2) Execution of CIG stand alone diagnostics. 3) IBM and CIG microdiagnostics executed from the 3145's microinstruction processor. 4) IBM on-line diagnostics such as OLTEP (Online Test Executive Program) and ASCP (Automatic System Checkout Program).

IBM offers only the last two levels of diagnostic support, both of which require use of the central processor to execute. Which means your operations stop when IBM's diagnostics start.

8 SERVICE

We're memory specialists. So if your CIG memory system ever does require service, you get a CIG memory expert. Not a generalist like IBM might send. Your CIG memory spares are on-site, too. Not at some remote depot. That's one of the ways we keep 650 CIG memory customers happy.

9 PACKAGE LEASING

CIG not only gives you 145 memory, we can lease you the mainframe and all your disc and tape peripherals to boot. That way you get everything from one source. All the equipment. And all the savings.

10 CIG/145. ITS BEST FEATURE IS US.

As we said before, you don't keep 650 memory customers happy by being charming. You keep them happy with innovative products backed by solid performance and service.

CIG is the world's leading independent memory supplier with sales, service, and systems engineering support available throughout the United States, Canada and Europe.

In addition to our 360/370 and Univac memory systems, other CIG products and services include 360/370 package leasing, plug-compatible block multiplexer and selector channels, and IBM plug-compatible disc and tape I/O sub-systems. What we've done for other people, we know we can do for you. Check us out. And call us in.

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1351 Washington Blvd., Stamford, Conn. 06902

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City _____ State _____ Zip _____

CW 65



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